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# TOWNSEND

## COMMUNITY DEVELOPMENT PROGRAM

"THIS REPORT WAS PREPARED AS BACKGROUND MATERIAL  
IN THE PLANNING OF THE TOWNSEND NEW COMMUNITY,  
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RECOMMENDATION OF THE MINISTRY OF HOUSING  
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## PHASE III REPORT

A study prepared for the  
TOWNSEND COMMUNITY DEVELOPMENT PROGRAM  
Ministry of Housing



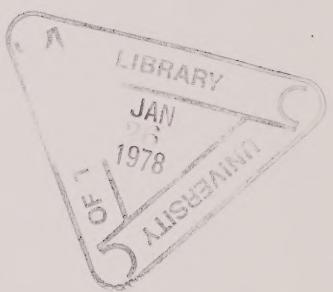
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## 1.00 INTRODUCTION

This interim report summarizes the work completed in the third and final phase of the planning study for the new community of Townsend. It presents refinements to the strategic plan for 100,000 persons developed in Phase II; and more detailed plans and programs for an intermediate community of 20,000 persons, a first stage of 5,000 persons, an initial subdivision of about 900 dwellings, and the town centre.

### 1.10 Structure of the Study

The planning program for the preparation of the Townsend plan has been organized in three phases.

In Phase I (January-March 1976), the development criteria for the new community were established, the regional context and site conditions reviewed, a development area for the community of 100,000 selected, and preliminary planning concepts prepared.

Phase II (April-September 1976) was used to prepare the strategic plan for the community of 100,000 persons, to select preliminary development areas for the community at 20,000 and 5,000, and to prepare initial plans for these areas.

Phase III (October 1976-March 1977) was used to refine the strategic plan and prepare the more detailed plans noted above.

An interim report has been prepared to present the work completed in each phase. These reports are not cumulative; they do not present material from previous reports unless new or revised information is available.

A final report is being prepared to summarize the main findings and recommendations of the study.

## 1.20 Outline of the Report and Recommendations

In Section 2, the planning basis of the strategic and detailed plans is elaborated further. Included are revisions to the regional employment and population growth projections, and to the recommended school systems. New material is also presented on the potential housing requirements and phasing program for the first 5,000 persons.

Section 3 presents refinements to the strategic plan as set out in Phase II. It contains recommendations and information on these topics:

- the potential traffic flows, lane requirements, rights-of-way, noise treatment and alternative alignment for the arterial road system;
- the preliminary layouts for the residential collectors and the town bicycle system;
- the potential routing system for public transit, together with the initial management and financial considerations;
- the preliminary sub-trunk and collector systems for sanitary drainage, storm water drainage and water supply.

In Section 4, a conceptual plan is presented for the town centre that explores its potential land-use distribution, circulation structure, physical character and development process. The plan is based upon planning considerations and land-use projections reviewed in the Phase II report.

Section 5 outlines the intermediate plan for the community at the 20,000 population level. This plan illustrates the next possible stage of growth, and provides a planning context for the more detailed plan for 5,000 people.

In Section 6, the detailed plan is presented for the "first stage" of the development, with housing for 5,000 persons and the initial local and regional facilities. One of the key recommendations is to locate the first development area on the east side of the Nanticoke. As this represents a change to the Phase II findings, the basis for this decision is also presented.

Section 7 reviews the draft subdivision plan prepared for submission to the planning approval process. The plan defines lots and sites for approximately 900 dwellings and the associated initial facilities.

Finally, Section 8 presents the comprehensive design prepared for about 200 dwellings in one of the initial housing areas. This design examined the potential housing and landscaping character of the area, when the roads and lots were laid out.

## 2.00 DEVELOPMENT BASE

The social and economic basis to the strategic plan has been presented in the reports for Phase I and Phase II. Since that time, the regional population and employment projections and the school requirements have been revised. More detailed work also has been completed on the housing requirements of the first 5,000 population; and the phasing of the housing and facilities up to this population level.

### 2.10 Population and Employment Growth

In mid-November of 1976, Stelco announced a postponement in the start-up date of their Nanticoke steel mill from late 1978 to early 1980, due to a reduced demand for steel. The completion of the coke ovens will now follow one year after the mill.

The completion of the full project has not been re-scheduled, nor has the development of the industrial park been affected.

Based upon the revised employment estimates from Stelco, new estimates of the employment and population build-up in the Haldimand-Norfolk Region to 1981 have been made. (See Table 2.10.)

The delay of the mill will stretch out the short-term construction program of the project. The peak demand for construction workers will remain at the current level of 1,000 on-site workers, rather than increase to 1,500 as previously expected.

The first 100 operational employees for the steel plant will be recruited in 1977. A total operational staff of 1,000 is expected in early 1981 and 11,000 employees are anticipated at full development.

The first permanent employees in the industrial park are expected in 1978.

Because of the Stelco delay, the projected new employment for 1977-1981 arising out of the Nanticoke industrial area has declined by about 1,500, or 18% from the previous total. The new households now expected has been reduced by 630, or 13%. The decline in households is less because most of the construction workforce lost would have been composed of commuters.

Table 2.10: Employment and Population Growth in Haldimand-Norfolk (arising from the Nanticoke industrial development)

Year	Employment		Households		Population	
	New	Old*	New	Old*	New	Old*
1977	2,191	2,040	820	860	2,860	3,005
1978	581	2,215	460	935	1,965	3,995
1979	1,392	1,110	755	1,275	2,630	4,440
1980	1,630	1,845	1,100	1,100	3,805	3,815
1981	858	950	915	510	3,375	1,885
TOTAL	6,652	8,160	4,050	4,680	14,635	17,140
DIFFERENCE	-1,508 (18%)		-630 (13%)		-2,505 (14%)	

\* made in March 1976

## 2.20 School Requirements

The public and separate school systems for Townsend have been reconsidered since Phase II, while utilizing the previous projections of the school enrolment. If school requirements do change again, it is anticipated that these also could be accommodated in the plan.

The school systems incorporate the views of the three local boards of education (Norfolk, Haldimand and Haldimand-Norfolk Separate), as well as the Ministry of Education.

## 2.21 School Structure

The public school system will have two levels. At the primary level will be a 600-pupil elementary school for kindergarten to grade 8. The secondary level will be served by 1,200-pupil high schools for grades 9 to 13.

The separate school system also will have 600-pupil elementary schools for kindergarten to grade 8. No separate high schools are planned, although an intermediate school for grades 9 to 10 or 7 to 10 may be provided possibly in the long term.

These school sizes represent a compromise between the local school boards' desire to have smaller schools, and the Ministry's concern to lower school costs by accommodating children in larger schools.

## 2.22 School Sites

The size of school sites will depend upon their association with recreation areas. (See Table 2.22.) To reduce land needs through shared-use, the school sites should be generally planned near complementary public parks — elementary schools near neighbourhood parks with playgrounds, and high schools near community parks having larger adult-oriented facilities.

Other school and community facilities also can be more fully utilized if shared. This is generally most appropriate with secondary schools, where parking space and good access from major roads are available, and where the facilities are designed to an adult scale. Facilities most suitable for use by students and the community are auditoria, vocational training workshops, gymnasiums, arenas, libraries and health services.

## 2.23 School Phasing

Townsend's school needs will vary over time. In the early years, Townsend will probably have a higher proportion of young family households with school age children than in later years. Therefore, the average support population for an elementary school should increase slowly as the town matures. (See Table 2.23a.)

The schools needed at each of the three population levels have been estimated, assuming that no school building will be constructed in advance of demand. (See Table 2.23b.) The temporary overflows must be accommodated in schools operating to overcapacity or using portable classrooms, or bused to schools in neighbouring communities. To provide flexibility in the early years, the possibility of building starter schools has been introduced. For example, a 300-pupil elementary school might be built on a full site, and then expanded to 600 pupil places.

At the 5,000 population, Townsend could have these schools:

- one 600-pupil K to 8 public elementary school with an overflow of 170 pupils (20% over-provision); and
- one 300-pupil separate elementary school with an overflow of 30 pupils (9%) — to be subsequently expanded to a full 600-pupil school.

Table 2.22: School Sites

Type of School	Grades	Capacity (Pupils)	Land Requirement* (ha)	
			Single School	School With Park
<u>Public</u>				
Elementary school	K-8	600	3.6 (3.2-4.0)	3.2 (2.8-3.6)
High school	9-13	1,200	7.2 (6.4-8.0)	5.6 (4.8-6.4)
<u>Separate</u>				
Elementary school	K-8	600	3.6 (3.2-4.0)	3.2 (2.8-3.6)

\* The figures in brackets indicate the permitted range.  
The figures without brackets are the average areas  
that have been used in preparing the land budgets.

Table 2.23a: School Catchments (average)

Type of School	Population Level		
	5,000	20,000	100,000
<u>Public</u>			
K-8	3,900	4,300	5,800
9-13	16,000	14,550	15,700
<u>Separate</u>			
K-8	9,100	10,000	13,550

Table 2.23b: Phased School Requirement\*

Type of School	Population Level		
	5,000	20,000	100,000
<u>Public</u>			
K-8	1 (170)	4½ (100)	17 (125)
9-13	0 (375)	1 (450)	6 (450)
<u>Separate</u>			
K-8	½ ( 30 )	2 ( 0 )	7 (225)

\* The figures in brackets are number of pupils over  
actual school capacity

The present plans do not provide a school for the approximately 375 secondary school students living in Townsend at this population level. These must be bused to Waterford or Hagersville, or temporarily accommodated in space rented from the community college.

By the 20,000 level, Townsend could contain the full range of schools:

- four 600-pupil public elementary K to 8 schools and, perhaps, one 300-pupil starter school with an overflow of 100 pupils (4%);
- one public 1,200-pupil secondary 9 to 13 school with an overflow of 450 (38%);
- two separate elementary 600-pupil K to 8 schools with no overflow.

### 2.30 Housing Market

The recommended housing mix has been prepared for the first 5,000 population, after examining the likely household and income characteristics of the incoming population and regional housing situation.

### 2.31 Regional Competition

Most of the housing currently being built in the region is in single detached units ranging in price from \$50,000 up to \$70,000. Some cluster row housing also is being marketed at \$30-40,000. In general, the higher priced detached units are selling poorly, while the lower priced row housing is selling particularly well.

During Townsend's initial years, the housing development outside Townsend that is presently planned in the region will be concentrated largely in Port Dover and Simcoe. Most housing will be ownership units, either single detached at \$50,000 or row condominium at \$30-40,000 (1976 \$). Little or no rental accommodation is planned.

Using current estimates, the total number of houses being built or planned for construction by 1981 in the region exceeds the projected growth in households to this date by about 1,300 units, or 30%. (See Table 2.31.) However, virtually all of this excess can be attributed to expensive housing costing \$50,000 or more approximately (1976 \$), which is well beyond the means of most of the incoming workers. At the same time, there is likely to be an under-supply for rental accommodation, and for ownership units in the lower \$40,000 range.

Table 2.31: Regional Supply of and Demand for Housing,  
Exclusive of Townsend (1976-1981) (1976 \$)

	Supply	Demand	Difference
<u>Ownership</u>			
\$52,000 +	1,601	486	+ 1,115
48-56,500	1,601	729	+ 872
46-49,000	529	364	+ 165
39-43,000	186	810	- 624
31-37,000	1,224	567	+ 657
	<u>5,141</u>	<u>2,956</u>	<u>+ 2,185</u>
<u>Rental</u>			
\$250	202	325	- 123
250-320	-	769	- 769
	<u>202</u>	<u>1,094</u>	<u>- 892</u>
Total	5,343	4,050	+ 1,293

### 2.32 Recommended Mix

Based upon the demographic and income material developed in Phase II, the potential initial residents of Townsend can be divided into four basic groups. (See Table 2.32a.)

The majority of the early residents — namely those in groups 2, 3 and 4 — are in households with children. These will prefer most likely to own their home rather than rent, if a suitable house can be provided at an affordable price. The housing developed elsewhere in the region indicates that affordable housing for purchase could be developed for these families, except perhaps for some in the \$10-15,000 income range (1976 \$).

The remaining group, which accounts for 10% of the total housing demand, is composed primarily of small households. These will probably seek apartment-type accommodation.

Rental accommodation at affordable levels can be also provided for this remaining group, and for that part of the \$10-15,000 income group that can not purchase a home. Whereas apartment accommodation is suitable for the small households, the families will seek ground-related accommodation if available. Furthermore, this latter group may still wish to purchase eventually.

Some households that could afford to purchase a home also may wish to rent temporarily. Most of the prospective residents coming to Townsend will be new residents in the region, and many will be also new employees of Stelco. They may view the move with some uncertainty, and may not wish to commit themselves by purchasing a unit until they are confident of their future.

Table 2.32a: Household Profiles of First 5,000 Population

	Group 1	Group 2	Group 3	Group 4
Proportion of 1,400 households	10%	43%	35%	12%
Household incomes*	Up to \$10,000	\$10-15,000	\$15-20,000	\$20,000 plus
Average persons per household	Mostly 1-2	Mostly 3-4	Mostly 3-5	Mostly 3-5
Age of head	Up to 25 years	25-35 years	30-40 years	35-45 years
Age of children	None	Preschool	Some preschool but mostly school age	School age
Workers in household	One	Mostly one	Mostly one, some two	Mostly two, some one
Stage of family life cycle	Mainly single persons	Beginning of family formation	Well into family formation	Maturing families
Housing preferences	Rental accommodation with little or no maintenance in "downtown" location. Many share accommodation.	Ownership of ground-related unit if possible, in residential area. Mostly first time buyers with little equity.	Ownership of ground-related unit in residential area. Some second time buyers looking for space for growing family and good investments.	Ownership of ground-related unit as spacious as possible. Mostly second time buyers interested in stable neighbourhoods.
Monthly payments*	\$170-210	\$250-320	\$320-400	\$400-600 plus

\* 1976 \$

To satisfy both of these family groups, the possibility of developing a third type of accommodation should be explored — namely, ground-related accommodation that could be initially rented and subsequently purchased. This rental/purchase housing will not affect the type of unit required — and hence the recommended mix. However, it may affect the layouts and standards used for local roads, public space and common facilities. Further, it may be dependent upon having a central housing agency to coordinate and manage the program.

Table 2.32b: Recommended Accommodation Mix for First 5,000 Population

House Type	Price Range (1976 \$)	Household Groups					%
		1	2	3	4	Total	
Detached houses:	52,000- 70,000(0)	-	-	-	165	165	30
	48,000- 56,500(0)	-	-	257	-	257	
Semi-detached houses:	46,000- 49,000(0)	-	-	127	-	127	9
	39,000- 43,000(0)	-	222	60	-	282	
Street townhouses:	31,000- 37,000(0)	-	170	30	-	200	20
	250- 320(R)	110	155	-	-	265	
Apartments	225- 250(R)	33	60	15	4	112	8
<b>TOTAL</b>		143	607	489	169	1,408	

## 2.40 Phasing Program

The housing and facilities needed for the first 5,000 residents in Townsend have been phased on an annual basis, using two relatively rapid rates of growth.

## 2.41 Housing

The initial housing, allowing for the revised regional growth due to the Stelco delay, has been phased in these two development periods (see Table 2.40):

- 1) A three year build-up would require completing 250 dwellings in the first year, and accommodating an extraordinarily large share of the market — 33% in the first year and rising to 64% in the third.

Table 2.40: Two Phasing Programs for First 5,000 Population

Facility	3 Year Build-Up				5 Year Build-Up					Total	
	1	2	3	Total	1	2	3	4	5		
<u>Housing (units 1976 \$)</u>											
\$52-70,000 (O)	-	50	115	165	-	-	45	60	60	165	
48-56,500 (O)	50	60	145	255	-	50	70	75	60	255	
46-49,000 (O)	50	75	-	125	50	50	25	-	-	125	
39-43,000 (O)	50	150	80	280	50	50	50	40	90	280	
31-37,000 (O)	50	75	75	200	25	50	50	75	-	200	
225-250 (R)	-	60	50	110	-	-	-	50	60	110	
250-320 (R)	50	100	115	265	25	50	60	50	80	265	
	250	570	580	1,400		150	250	300	350	350	1,400
<u>Elementary Schools (pupil places)</u>											
Public K to 8	-	300	300	600	-	-	300	-	300	600	
Separate K to 8	-	-	300	300	-	-	-	300	-	300	
<u>Marketing and Commercial Centre (m<sup>2</sup>)</u>											
	2,800		2,800		2,800		2,800		2,800		
<u>Community Facilities (number)</u>											
Neighbourhood park	-	1	-	1	-	-	1	-	-	1	
Equipped playground	1	2	2	5	1	1	1	1	1	5	
Tot lot	2	5	5	12	1	2	3	3	3	12	
Meeting hall*	1	-	-	1	1	-	-	-	-	1	

\* in marketing centre

2) A five year build-up would also require a large market share — starting with 20% and rising to 35% approximately — but allows greater flexibility to increase or reduce annual housing production according to market conditions.

The phasing of the first housing is based upon these goals:

- minimize early risk and optimize cash flow;
- provide sufficient units early to establish a sense of neighbourhood and commitment;
- create a stable ownership-oriented image;
- test the acceptability of new housing forms and concepts;
- fill the gaps in current supply of housing elsewhere in the region;
- appeal to a variety of potential residents in each year;
- incorporate flexibility to respond to new market conditions.

These criteria have been translated into the following specific objectives:

- 1) Provide a variety of housing units each year.
- 2) Provide units early that can be purchased by a large part of the market, namely in the \$30-50,000 range.
- 3) Delay the bulk of rental accommodation to the later years of this period, except for ground-related family rental units with the option to purchase or rent.
- 4) Delay the more expensive units above \$56,000 until the later years.
- 5) Provide a minimum of 150 units in the first year.

#### 2.42 Shopping and Marketing Facilities

The initial activity centre has been planned as the focus for the first housing areas of 5,000 persons. (See Section 6.32.) The site can accommodate an estimated 2,800 m<sup>2</sup> (30,000 ft<sup>2</sup>) of floorspace, together with associated parking, service areas and some apartment units. The facilities to be provided on this site have been tailored to this limit. (See Table 2.42.)

To be reasonably self-sufficient, the 5,000 population will require a range of convenience shopping and personal and professional services. The main commercial component will be a general store with food, drugs, miscellaneous goods and temporary post office facilities.

The development agency for Townsend could also require a site office — perhaps for a staff of 10 to 20 as a first estimate — plus a marketing centre to display future housing and plans.

Table 2.42: Components in the Initial Activity Centre

General store	700 m <sup>2</sup>
Personal services: barber hairdresser dry cleaner bank	650
Restaurant	200
Development offices	500
Marketing centre (with meeting hall)	500
Professional office space: doctor dentist	150
LCBO/Brewers Retail	100
TOTAL	2,800 m <sup>2</sup> (30,000 ft <sup>2</sup> )

The phasing of these facilities is based on the following goals:

- establish an early focus for the first housing area;
- complete the centre quickly in order to avoid continuous expansion.

These goals lead to this strategy:

- 1) Combine the initial retail space for food, drugs and personal services with the office and marketing space.
- 2) Build the total space of 2,800 m<sup>2</sup> in the first year.
- 3) Allow the marketing centre to double as a meeting hall in the evening for the first few years.
- 4) Build the major shopping facilities (specialist stores and major food outlet) separately in the town centre later when economically viable.

On this basis, the rate of population build-up will not affect the phasing of these facilities, as they will be built in the first year in both cases. The major difference between the two build-up rates will be the time required to financially break even.

#### 2.43 Elementary Schools

The 5,000 population will require two elementary (K to 8) schools — a full 600-pupil school and a first stage of a 600-pupil separate school. (See Section 2.20.)

The Ministry of Education will not finance schools until the demand is present on the site. Generally, a minimum of 341 pupil places is required for an elementary starter school. Since separate schools in the region have generally less than 300 pupils, this minimum could be perhaps waived. For simplicity, the starter school has been presently based on 300 pupils, or half the full school.

In the early years before a school is built in Townsend, the pupils must be bused to existing schools in other communities. Later, any surplus could be bused, accommodated in portables or taken up temporarily by overcrowding. The Ministry allows up to 10% overloading in public schools.

#### 2.44 Community Facilities

The early residents will need a multi-purpose hall for public meetings and local gatherings. The marketing centre could be used for meetings in the evenings in order to reduce early space requirements. The elementary school when built also could provide the same resource.

The early recreation facilities for Townsend should include some or all of the following:

- a badminton court ( $170 \text{ m}^2$  or  $1,800 \text{ ft}^2$ )
- a volleyball court ( $170 \text{ m}^2$  or  $1,800 \text{ ft}^2$ )
- natural ice area
- double baseball field with overlapping soccer pitch ( $12,500 \text{ m}^2$  or  $135,000 \text{ ft}^2$ )
- four tennis courts ( $2,700 \text{ m}^2$  or  $29,000 \text{ ft}^2$ )

Most of these facilities generally will be located in neighbourhood parks linked with elementary schools. Their phasing, therefore, will depend somewhat on school construction.

The skating area can be provided on the first retention pond, which is programmed for development at the same time as the local centre and first housing.

Consideration should be given to perhaps providing a swimming pool as a marketing device.

Local playspace is also planned within the housing areas. As a first guideline, this could include equipped playgrounds of approximately  $1,500 \text{ m}^2$  ( $16,000 \text{ ft}^2$ ) for every 250 dwellings, and tot lots of  $150 \text{ m}^2$  ( $1,600 \text{ ft}^2$ ) for every 100 dwellings. These would be completed at the same time as the local housing.

## 3.00 STRATEGIC PLAN (100,000 Population)

Various aspects of the strategic plan as recommended in Phase II have been examined in greater detail, including the road system, public transit, engineering services and secondary centres.

### 3.10 Road System

A town-wide system of arterials was presented as a major component of the strategic plan. In the interim, the potential lanes, noise impact, rights-of-way and alignments of these roads have been examined further. A preliminary residential collector road and an initial bicycle system also have been developed.

### 3.11 Traffic Flows and Lane Requirements

The potential travel patterns at full development were estimated during the evening peak hour for all vehicle trips into and out of Townsend. Peak traffic conditions can be expected during this period. The travel forecasts were translated into lane requirements for the arterials to assist in identifying appropriate rights-of-way. (See Figure 3.11a.)

Trips entirely within the community account for about one half of the total trips in the evening peak hour, with about 20% of the total being to or from the town centre. Inbound trips to Townsend are about one third of the total evening trips, with about one quarter of the total being from the Nanticoke industrial area. The evening work trips from Nanticoke would be higher if the steel plant did not use special shifts.

Because of the traffic generation expected, the major town uses — the town centre and on-site industrial areas — must be highly accessible from both the community and the region. In addition, the high degree

of interaction between the town and the Nanticoke industrial area will require good roadway connections. The modelling also indicates that traffic movement from Simcoe and the region to the west will be significant.

The highest traffic volumes occur in the vicinity of the town centre. The volumes along both Townline Road and the east-west regional arterial to the south, when combined with the high turning movements, ultimately will warrant probably six lanes for both roadways. The town arterials to the north and west probably will be four lane facilities. (See Figure 3.11b.)

Elsewhere, the arterials will probably need four lanes in the central part of the community, and two lanes in the peripheral areas.

With the expected vehicle trips between Townsend alone and the Nanticoke industrial area, both Townline Road and the new north-south link to the west will require four lanes.

The diagonal link from highway 3 into the community will also need four lanes ultimately. If this road or another road north from highway 3 is not developed, the two other north-south links probably will increase to six lanes in the long term. In any case, the magnitude of turning movement from highway 3 to the community suggests that special intersection treatment, such as exclusive left-turn lanes and traffic signal advance, may be required at highway 3 to all of these north-south roadways.

### 3.12 Design Standards

The functional and performance characteristics of the arterial roads are based upon current recommended practice, modified to some extent to reflect local design conditions. (See Table 3.12.)

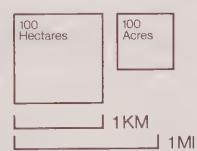
The recommended rights-of-way for the regional arterials within the urban area, which could eventually accommodate a maximum of 6 lanes, are 46 m (150 ft). The rights-of-way for the town arterials with a maximum of four lanes are 36 m (120 ft). These are the maximum rights-of-way for these road categories generally subsidized by the Ministry of Transportation and Communications. The rights-of-way preferred by MTC are 40 m and 30 m (130 ft and 100 ft respectively). (See Figure 3.12.)

The wider rights-of-way are recommended to provide some flexibility in the strategic plan to accommodate additional traffic or turning lanes, bicycleways, service easements and any unforeseen transport needs. (See Section 3.16.) They also provide a slightly



## Projected Traffic Flows Evening Peak Hour Vehicle Traffic (Townsend only)

2000 Vehicles  
1500  
1000  
500



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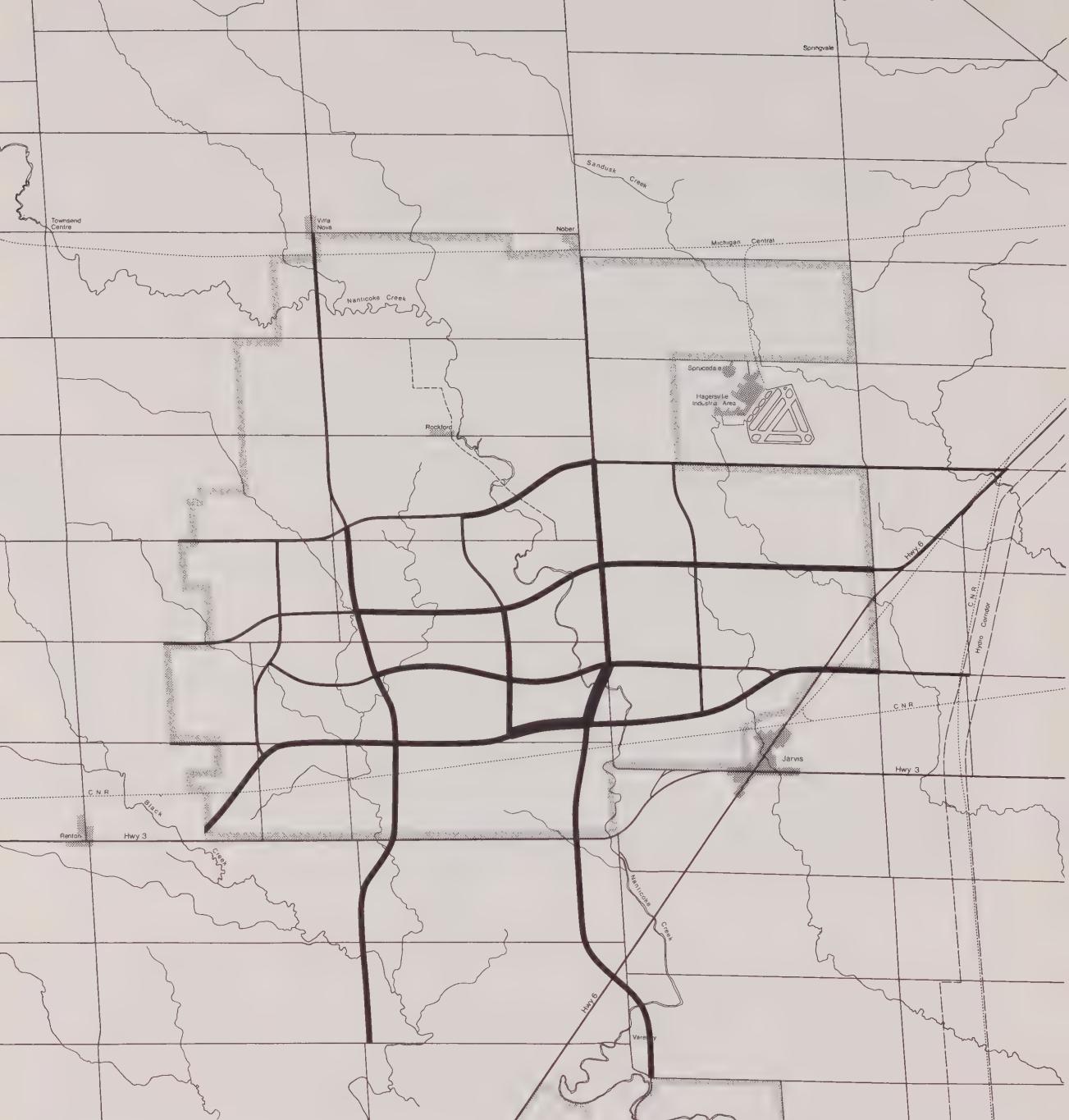
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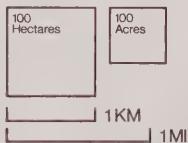
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## Projected Lane Requirements

- 6 Lanes
- 4 Lanes
- 2 Lanes



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wider verge — and in the case of the regional arterials, a central median — for roadside landscaping, and if necessary, for earth berthing to alleviate traffic noise. (See Section 3.13.)

The comprehensive landscaping of these arterials — as well as the major elements of the public infrastructure — is especially recommended as a means of giving the community a unique character and image.

Although these slightly wider rights-of-way will add to the overall land requirements for the roads, this can be made up many times by the recommended reductions in the local road allowances, which as generally laid out greatly exceed the traffic and operational requirements. (See Section 7.20.)

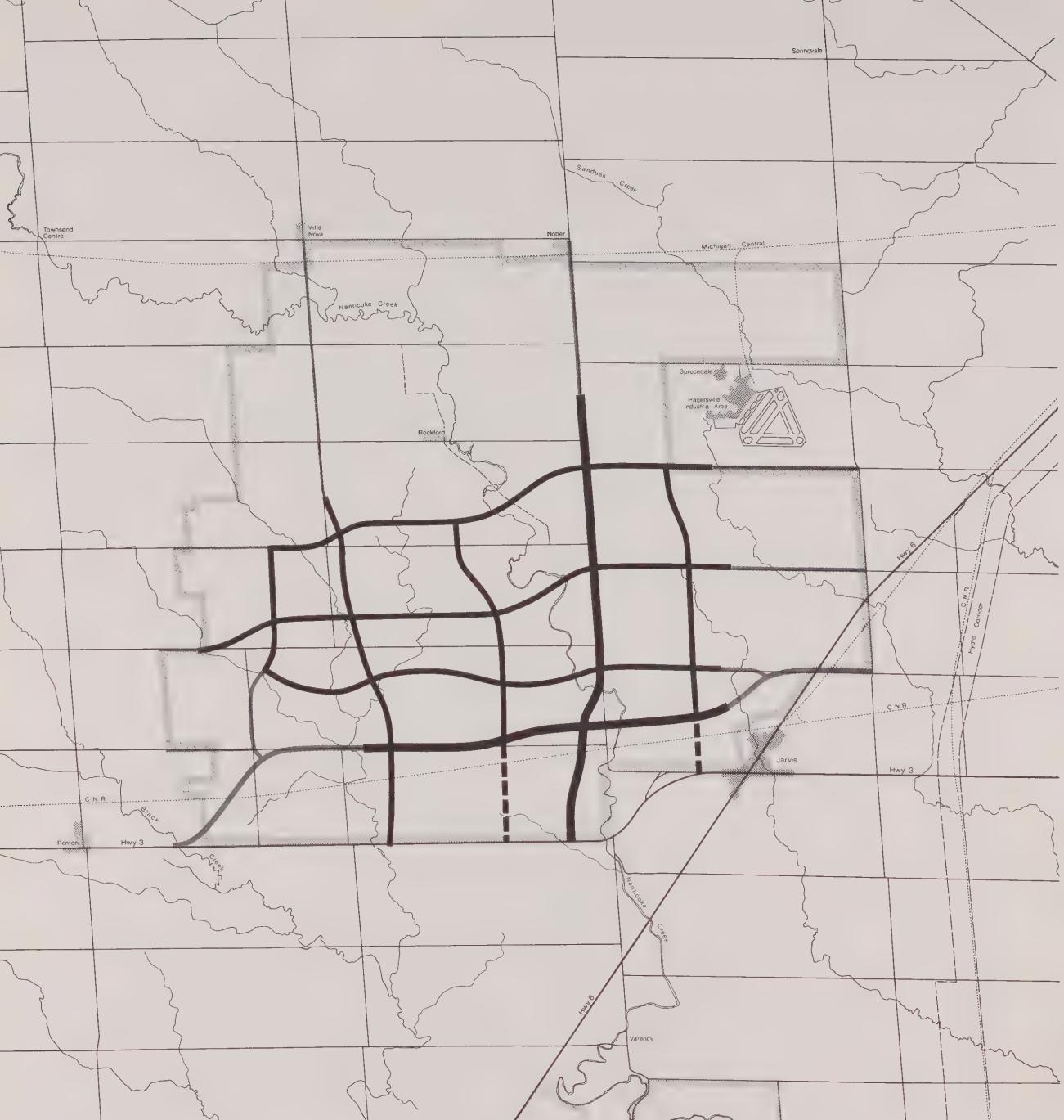
Table 3.12: Arterial Road Standards

	Regional Arterial	Town Arterial
<u>Capacity Characteristics</u>		
Traffic volumes (AADT)	30,000	25,000
Design speeds	65-100 km/h (40-60 mph)	65-80 km/h (40-50 mph)
Typical posted speeds	50-80 km/h (30-50 mph)	50-65 km/h (30-40 mph)
<u>Cross Section Features</u>		
Rights-of-way	46 m (150 ft)	36 m (120 ft)
Pavement width: <sup>*</sup>		
2 traffic lanes	10.5 m (35 ft)	10.5 m (35 ft)
4 traffic lanes	14 m (46 ft)	14 m (46 ft)
6 traffic lanes	20.5 m (68 ft)	-
Traffic lanes	2-6x3.5 m (11 ft)	2-4x3.5 m (11 ft)
Parking lanes	none	none
Median	4 m (13 ft)**	none
Sidewalks	none***	none***
Bicycleways	none	2x1.5 m (5 ft) with 1.5 m (5 ft) shoulder
<u>Geometric Features</u>		
Centre line radius (minimum)	215-385 m (700-1,260 ft)	215-300 m (700-1,000 ft)
Stopping sight distance (minimum)	85-145 m (275-475 ft)	85-100 m (275-350 ft)
Intersection radius (minimum)	15 m (50 ft)	15 m (50 ft)

\* inclusive of 2 ft (0.5 m) for two curbs; but exclusive of turning lanes at intersections

\*\* minimum necessary for landscaping; increases to 5 m (17 ft) where left turn required

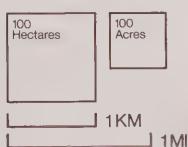
\*\*\* main pedestrian movements to be generally accommodated on separate walkways



## Recommended Rights-of-Way Urban Standards      Rural Standards

- 46 m. r.o.w.
- 36 m. r.o.w.

- 36 m. r.o.w.
- 30 m. r.o.w.
- 20 m. r.o.w.



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### 3.13 Traffic Noise

Noise generated by vehicle traffic on major roads is increasingly being considered a nuisance by adjoining residents. To provide overall flexibility, provision has been made in setting out the arterial roadways for the accommodation of noise control measures. When more detailed plans are developed for the adjacent housing areas, alternative measures may be used instead, as in the case of the draft subdivision plan. (See Section 7.30.)

#### Noise levels

The Ministry of the Environment\* recommends a daytime (7:00-23:00 hours) level of 55 dBA and a night-time (23:00-7:00 hours) level of 50 dBA for residential development in urban areas, using 24-hour energy equivalent sound levels (Leq). The noise levels are typically measured outdoors in the main recreation space of the dwelling. Meeting these sound levels outdoors should ensure that the indoor levels are acceptable.

The potential traffic noise impact of the arterial network at the 100,000 population level was estimated in dBA (Leq) at 15 m (50 ft) from the edge of the nearest lane. (See Figure 3.13.) The noise levels are dependent primarily upon car and truck traffic volumes and average operating speeds. Sound levels at intersections can be as much as 4 dBA higher than along the approach roads.

Traffic from highway 3 is not expected to affect residents of Townsend, as it is about 1,000 m (3,300 ft) from the nearest housing area.

Noise from the CN tracks, which are about 350 m (1,150 ft) from the nearest housing, is expected to be less than that from the intervening regional arterial. The measures taken to overcome the traffic noise, therefore, should suffice for the railway noise, especially as this will be only occasional.

The noise levels along collector and local streets, with their lower volumes and speeds, typically will fall below the recommended standards.

The traffic noise at 20,000 and 5,000 population levels generally will be less than at the full development. Therefore, the noise control measures should be designed on the basis of the potential worst case at full development.

\* Ministry of the Environment, "Guidelines for Noise Control in Land-Use Planning", publication NPC-131, May 1976.

### Noise control measures

The planning at the strategic level can only deal with those measures directly associated with the arterial roadways. The alternative measures associated with the housing layout must be left for the subsequent detailed planning stages.

There are five general methods of reducing the impact on residents of noise from adjoining major roads: (1) site planning methods; (2) architectural design; (3) intervening structures as acoustical barriers; (4) earth berms; and (5) vertical walls.

In subsequent detailed subdivision design stages, site planning and architectural design should be considered for noise control. The impact of traffic noise on outdoor spaces can be alleviated in the housing layouts as follows:

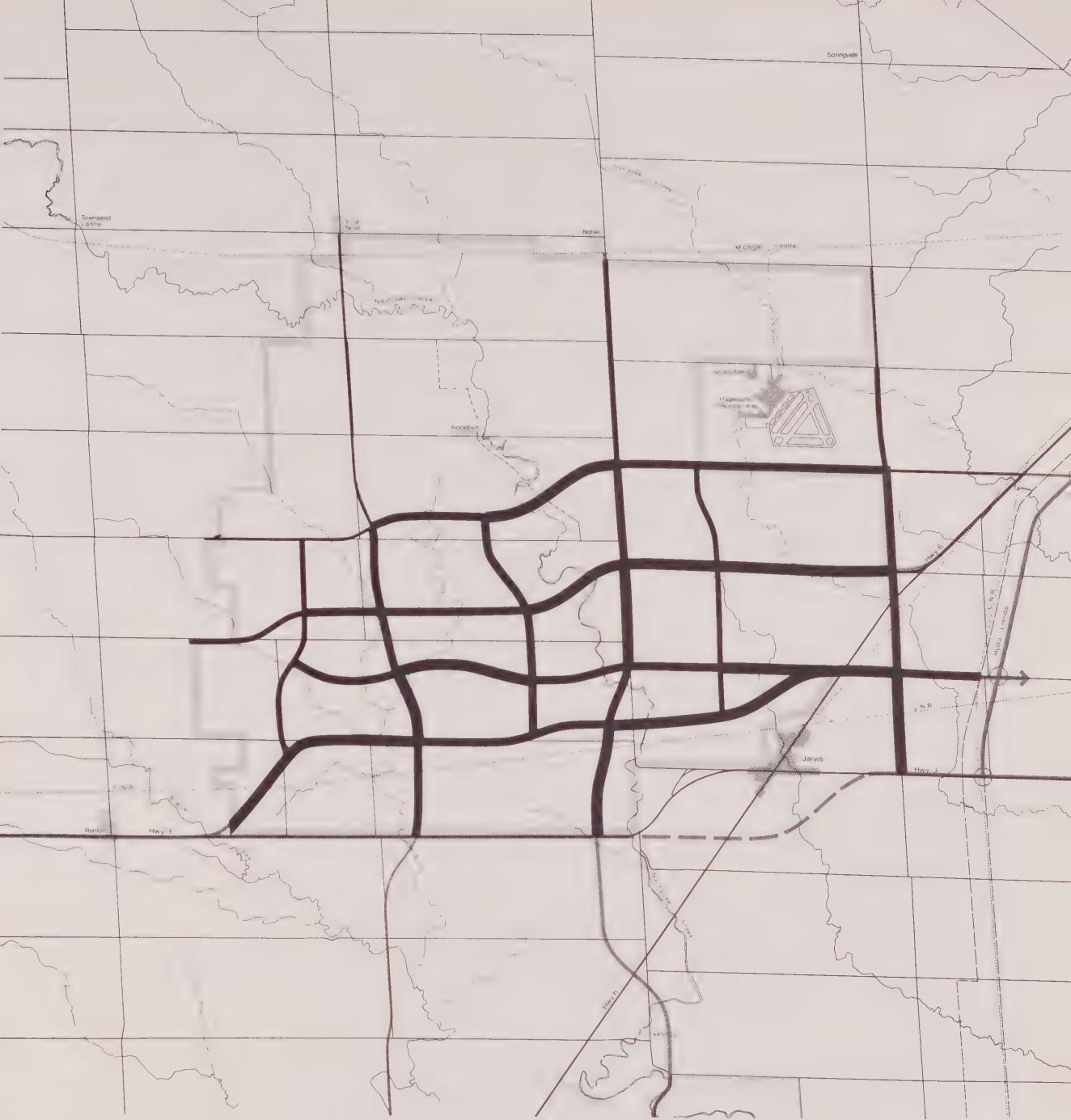
- Site planning, such as placing local roads between the housing and noise source to increase the setback, and placing other uses like industry between housing and the noise source.
- Architectural design, such as using single aspect buildings facing away from the sound, and using the building to shield the outdoor space.

These measures must be considered on a site-by-site basis, as they will depend upon local site conditions and housing requirements. These may prove to be the best means of noise control in many cases, but they may also increase development costs, although these will be passed on to the local residents rather than carried by the road authority.

For the various traffic noise levels predicted, the setbacks required between a house and the nearest edge of pavement to meet the recommended sound levels are the following:

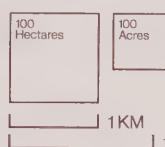
<u>Sound Level Range</u>	<u>Projected Distance to Attain 55 dBA</u>
64-67 dBA	90 m (290 ft)
61-64 dBA	45 m (190 ft)
58-61 dBA	35 m (120 ft)
55-58 dBA	25 m ( 80 ft)

A town arterial in Townsend with 4 lanes set in the 36 m (130 ft) recommended right-of-way will typically provide a setback of about 27½ m (90 ft) to the rear of the house. Therefore, the higher predicted noise levels cannot be alleviated to the recommended standard of 55 dBA without using some additional controls.



## Projected Noise Levels\*

- Source Noise Level at Curbside: 64-67 dBA
- : 61-64 dBA
- : 58-61 dBA
- : 55-58 dBA



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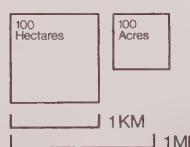


\* Approximate 55 dBA ( $L_{eq}$ ) noise envelope on flat ground without barriers



## Alternative Arterial Alignments

- Preferred Alignments
- Possible Link to be Reconsidered
- Possible Links to be Added
- Alternative Alignments



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The barriers needed to attenuate the predicted sound levels to acceptable limits are the following:

64-67 dBA	3.5 m (11.5 ft)
61-64 dBA	2.6 m ( 8.5 ft)
58-61 dBA	2.3 m ( 7.5 ft)
55-58 dBA	n.a.

A barrier less than 2.3 m (7.5 ft) is ineffective because the exhaust noise from trucks passes directly over it.

Although the erection of earth berms and barriers adds to the cost and may create problems of snow drifting and maintenance, they must be considered in order to allow flexibility in the choice of the ultimate noise control measures. Indeed, various combinations of site planning techniques, use of non-habitable structures and landscaped earth berms would all probably be part of the eventual solution.

#### Noise recommendations

In the strategic plan, to provide flexibility for the subsequent site planning, the recommended arterial rights-of-way allow for the construction of earth berms to alleviate the traffic noise. The use of berms will depend upon the site plans and architectural designs prepared for the abutting housing areas. If they provide satisfactory noise treatment, then the berms will not be needed for this purpose.

At the detailed subdivision design stage, planners, developers and consultants should be encouraged, as far as possible, to consider site planning design techniques, and intervening structures, as well as the use of earth berms, to attain the level of 55 dBA.

#### 3.14 Road Alignments

The framework of arterial roadways, as set out in the strategic plan, has considerable flexibility. The framework has been established after studying the overall transportation requirements of the town and the main environmental features of the site. However, the actual alignments of most of these roads still must be fixed. Furthermore, different road links to those shown may be eventually required in certain places.

In the course of developing the plan, a number of alternative alignments have been considered. (See Figure 3.14.) Some vary as much as 300 m (1,000 ft), which is indicative of the degree of flexibility that remains in some cases. All of these alignments must be examined in detail prior to development. The final route will depend upon a variety of factors: engineering costs; environmental impact; operational requirements; and the land parcels left for development.

The road that probably will require the most extensive study is the western north-south regional arterial. Of the two general options shown, the western one appears to have the least environmental impact, but it will require three bridge crossings of the Black Creek system. These crossings will be costly because of the wide flood plain. The eastern option, which has been shown in the strategic plan, needs only one crossing, but it will cut through a major woodlot and could adversely affect a significant group of historic buildings in the area.

Along certain lengths of road, particularly to the west of Townline Road, the arterials have been aligned parallel to but away from the existing concession roadways. These alignments were selected in order to preserve existing buildings and roadside hedgerows, and to retain the existing bridges for local traffic use. To the east of Townline Road, these considerations are less important, and therefore, the roads have been aligned on the existing roadways.

The roads in the northwestern corner of the plan also may require further study, in order to control encroachment into the permanent agricultural area.

The alignment of the new highway 6 to the east of the community is not fixed. A preferred route has been identified to the east of the hydro corridor, but an alignment along the eastern edge of the site remains a possible alternative. As noted in the Phase 1 Report, the western options probably will better serve the community by providing (1) a more attractive entrance to the community and (2) a more direct access to the northeastern industrial area. The recommended road system could accommodate either alternative. In both cases, interchanges with the Townsend roads will be limited to the two regional arterials.

The plan also incorporates the possibility of adding two other specific roadways. (See Figure 3.14.) All of these could provide additional links between the community and highway 3 in order to respond to various circumstances:

- 1) The eastern link will depend largely on the growth of Jarvis. It will facilitate movement between Townsend and Jarvis, and perhaps, relieve traffic on the Townline Road alongside the town centre.
- 2) The middle link will depend largely on the extent of development in the southern Townsend industrial area.

The westernmost section of the southern town arterial possibly could be eliminated from the arterial system. While it is desirable to retain this road for reasons of continuity and access, this road will require two costly bridge crossings in a short distance, and it might constrain the alignment options for the north-south regional arterial discussed above.

### 3.15 Collector Roads

A residential collector road system has been laid out for the central part of Townsend. (See Figure 3.15.) Although these collectors cannot be actually planned until detailed planning is undertaken for each residential area, this preliminary layout does serve a number of purposes:

- to ensure that a collector system could be reasonably planned before determining the arterial road system;
- to provide a context for the detailed 5,000 population plan;
- to illustrate how these roads might be laid out in conjunction with local pedestrian and transit systems.

These collectors functionally are local distributor roads for the housing areas. As such, they have been laid out to facilitate local car and bus traffic within each grid square, to the surrounding arterials, and to the adjoining housing areas. At the same time, they have been laid out to discourage non-residential extraneous traffic passing through the grid square.

The residential collector system as shown has been planned primarily to create a limited number of "finder" roads in each grid square. These roads are aligned so that they will generally pass within approximately 300 m (1,000 ft) of every house. All local streets within the grid square will start from these roads. These streets can be laid out as loops, P-loops or cul-de-sacs, depending upon circumstances.

All of the finder roads connect in at least one place with the arterial system and in most cases, cross the arterials to the adjacent grid square. These connections are supplemented often by other short "gate" roads, in order to link the housing in each typical grid square to the surrounding arterials approximately six times.

The finder and gate roads, which together comprise the residential collector system, generally are designed with 10 m (32 ft) wide pavements in 20 m (66 ft) rights-of-way. The traffic conditions will require only two lanes, or 7 m (22 ft) of pavement, but the extra pavement is needed for various operational reasons: turning traffic, stopping buses, emergency situations, as well as limited on-street parking. The extra space also can be used as part of the town-wide bicycle system.

A residential collector system based upon the above design principles has been recommended for a number of reasons:

- 1) The system is common in Ontario, indicating it leads to reasonable development economies and traffic conditions.

- 2) It creates a hierarchical road structure that keeps most housing streets free of non-local traffic and discourages extraneous traffic through the grid square.
- 3) Furthermore, the focusing of traffic on a single residential road helps in developing an independent pedestrian system through the housing area.
- 4) By creating a linked roadway system that passes generally within 300 m of every house, it can provide a reasonably efficient and well-located route for bus services within the housing area.
- 5) Finally, the system would appear to have sufficient flexibility to be applied in most residential areas in Townsend, even when they are divided by creeks.

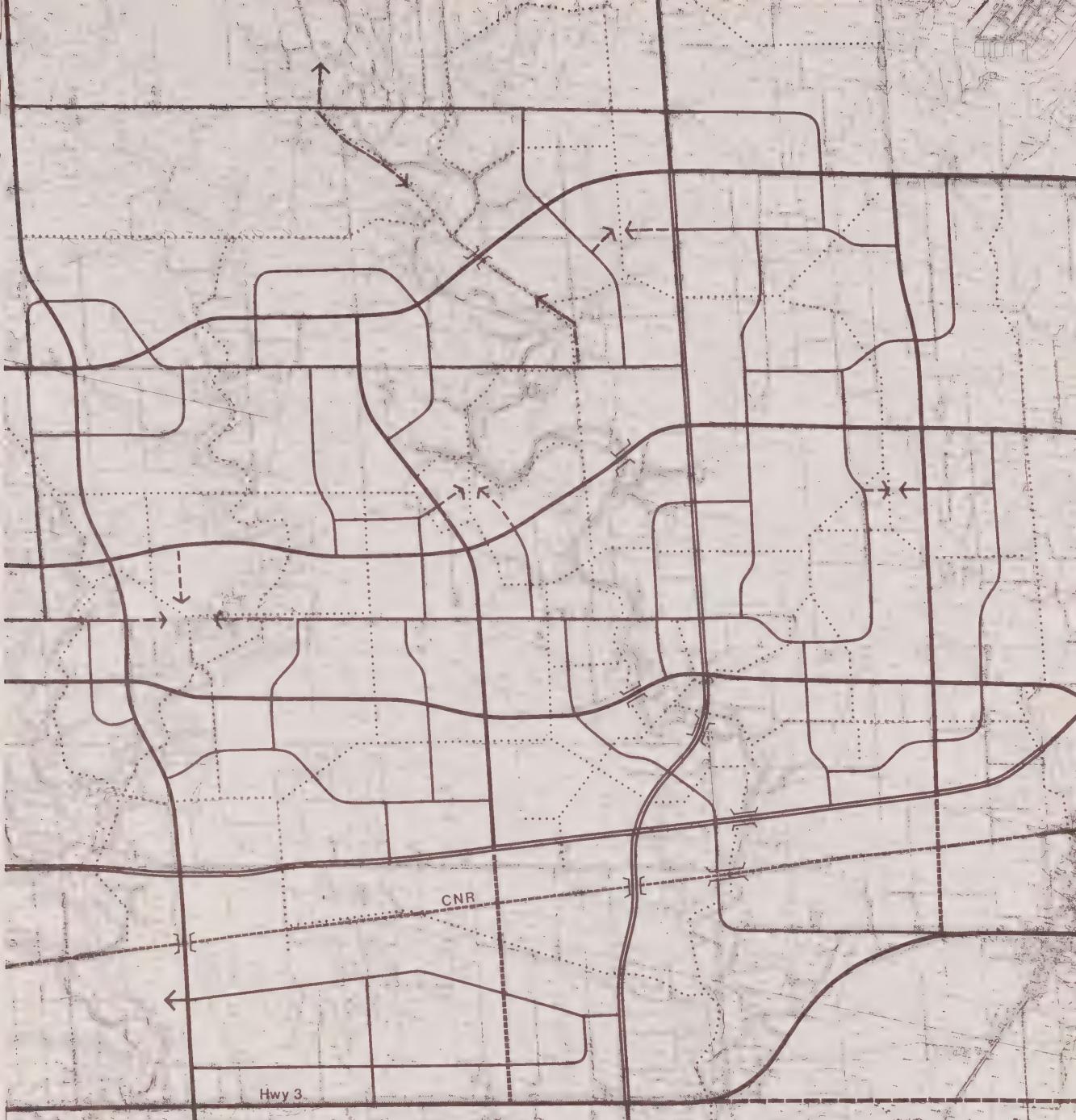
Limited access routes are shown through the secondary centres. While these will provide good car access to the facilities, they are intended to restrict through movement, and provide an opportunity to give priority to buses and pedestrians.

All local facilities, like corner shops and elementary schools, and higher density housing with on-site parking provision, should be located along these collector roads. On the other hand, low and medium density housing — with their frequent curb cuts and on-street parking — should be accommodated as far as possible on the local streets off the collectors. This has a number of advantages:

- 1) It will serve to differentiate the collectors from the local streets, and thereby provide greater visual clarity to the housing structure.
- 2) It also will reduce the incidence of delays and the potential for accidents caused by parked vehicles and turning/backing movements from driveways.
- 3) Finally, it should preclude these roads ever being expanded to four lane roadways, which would increase capital costs as well as traffic speeds through the residential environment.

### 3.16 Bicycle Routes

The planning for bicycles in Townsend has been based on providing separate lanes for the different modes of movement — bicycles, pedestrians and motor vehicles — within shared rights-of-way. The provision of a fully separated system exclusively for bicycles cannot be justified by the potential usage, especially in Townsend where winter weather will curtail bicycling for virtually half of the year. The alternative at the other extreme, the shared use of pedestrianways and roads without any separation, creates unsafe and inconvenient conditions for all modes.



## Collector Road System

- [Light Gray Box] Collector Roads
- [Dark Gray Box] Town Arterials
- [Medium Gray Box] Regional Arterials
- [Dotted Line] Major Pedestrian Routes
- [Left Arrow] Limited Access Roads

10 Hectares      10 Acres

500 M      2000 FT



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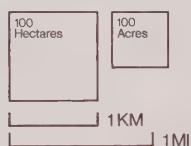
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## Potential Bicycle Routes

- High Speed Bicycleways
- Low Speed Bicycleways



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Bicycles can be used for a variety of trips, but for the purposes of planning, these can be divided into two types: specific trips for work, shopping and school; and casual trips for recreation and leisure. Both types of trip have different needs.

Casual recreation and leisure trips generally do not require direct routes, nor are they to specific destinations. These trips are generally made at relatively low speeds and a high proportion will be made by children.

In Townsend, these low-speed leisure-oriented trips will be accommodated generally on routes alongside the town-wide pedestrian system. (See Figure 3.16.)

This system will run through the creek valleys, woodlots and other most attractive parts of the site. It will provide access to the main recreation areas, and be grade-separated in most cases at crossings of the arterial road system. The system provides a variety of routes so that alternative scenic paths are available for both outbound and inbound trips. Because cyclists and pedestrians on the same route can conflict with one another, separate paths created by different surfaces or structural separations may be required.

The trips for specific purposes will be oriented towards the regional centre, employment areas and other main activity centres. The system serving these trips must be both comprehensive and direct. It must be also designed for relatively high speeds. These criteria can be best satisfied by incorporating bikeways in the road rights-of-way.

In the recommended plan, this high-speed system will be accommodated on the town arterials. Separate lanes  $1\frac{1}{2}$  m (5 ft) wide are planned on both sides of these roadways separated by  $1\frac{1}{2}$  m (5 ft) shoulders. These will ensure the safety of the cyclist and prevent the cyclist from interfering with vehicular traffic movements. Along these routes bridge crossings and road intersections must be designed to accommodate bicyclists.

In the short-term, separate bicycleways also could be provided along the regional arterials in space reserved for additional traffic lanes. However, no long-term provision along the regional arterials has been planned because of the traffic speeds expected and the limited access points to be provided.

Both sets of bicyclists also can be accommodated on the residential collectors. Painting priority lanes for bicycles is possible along residential collectors. In general, the 10 m (32 ft) pavements planned for these roads should be sufficient to accommodate both cars and bicycles safely.

A special pedestrian and bus mall has been planned through the town centre, using grade crossings under the surrounding arterials. Bicycles also can be accommodated in this system, and any similar links provided in other areas of intensive activity like the secondary centres.

### 3.20 Secondary Centres

The distribution of the secondary centres shown in the strategic plan has been modified, and their contents, layout and phasing more fully examined.

### 3.21 Location and Access

Four secondary centres are now recommended within the residential fabric of the community. The town centre will also act as a fifth secondary centre to the surrounding population for many of the same functions. (See Figure 3.20.)

The four separate secondary centres have been located at arterial intersections to provide good car accessibility from the wider community. These roads will be supplemented by residential collectors providing direct access from the neighbouring housing.

These centres also have been located where they can serve as a focus for the local bus services. Each centre should have a central stop, where patrons can transfer between services and the buses can wait while adjusting to their schedules. These stops could also serve as collecting points for special commuter buses to the Nanticoke industrial area. Because of the degree of vehicular and pedestrian activity in this area, special bus-only links may be required to facilitate bus movements. (See Section 3.30.)

The town-wide pedestrian system also passes through these centres. Grade separated crossings should be provided for pedestrians and cyclists along these routes where they cross the arterials. Therefore, nearly every home should be within a 15 minute walk of one of these centres via a direct route separated from all major traffic.

The preliminary collector road system set for the community indicates that limited access roads could be used into the secondary centres. (See Figure 3.15.) These should serve to provide good car access, but also allow for creating a central place for pedestrians and buses.

### 3.22 Facilities

Secondary centres are mixed-use activity centres, providing for the day-to-day needs of the approximately 15-25,000 people surrounding them. (See Table 3.20.)

The main commercial component in each centre probably will be a large supermarket. Associated shops could include a drugstore, dry cleaner, barber, hairdresser,

sub-post office, bakery, shoe repairer and other personal services. Local offices could accommodate doctors, lawyers and similar services.

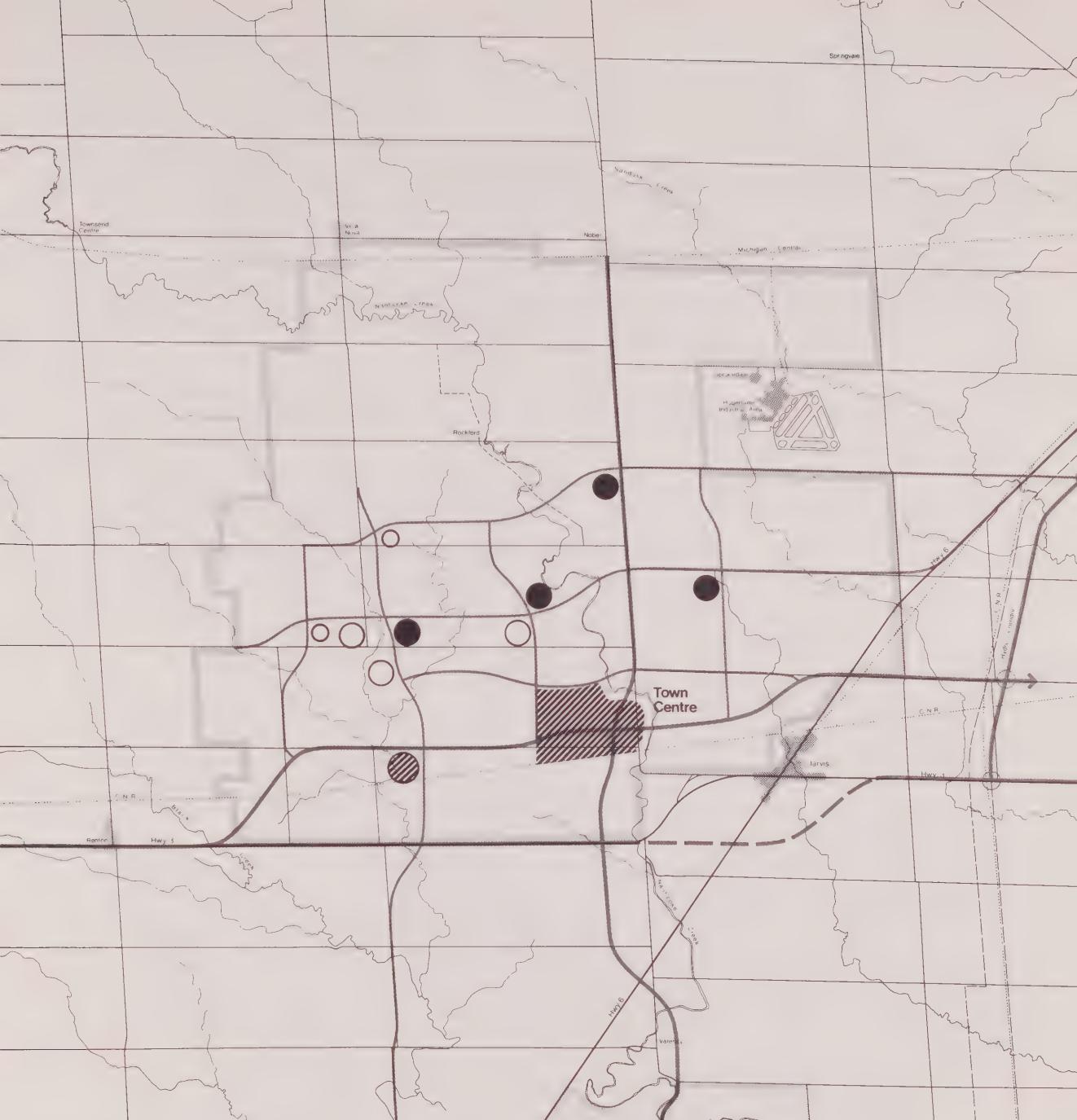
The largest component in each will be a public high school. As presently planned, these will each accommodate 1,200 pupils. By locating them in these centres, it is intended that their extensive facilities will be made available for wider public use.

The centres could each have a range of community facilities: for example, a separate elementary school, a community health clinic, a day care facility and/or nursery school, a meeting hall and one or more churches.

Table 3.20: Potential Components in a Typical Secondary Centre

Facility	Building Area (m <sup>2</sup> )	Site Area (ha)
<u>Commercial Facilities</u>		
Supermarket	3,300-3,700	2½-3½
Associated shops	2,200-3,300	
Local offices	1,000-1,500	½
	6,500-8,500	3 - 4
<u>Educational Facilities</u>		
Public high school	13,900	5½
Separate elementary school	4,200	3½
	18,100	9
<u>Social and Other Facilities</u>		
Church campus (3 churches)	2,300	1 - 2
Community health clinic	1,100	
Branch library	800	
Nursery school	400	
Local police station		2
Sub-post office	1,000	
Community hall		
Miscellaneous facilities	5,600	3 - 4
<u>Recreational Facilities</u>		
Indoor pool and recreation hall	4,200	1
Sports fields and surface courts	-	6
General parkland	-	2
	4,200	9
<b>TOTAL (approximately)</b>	<b>35,000</b>	<b>25</b>

Community parks with extensive recreation and leisure facilities also are planned in each centre. Indoor facilities for all-year use could vary from centre to



## Secondary Centre Locations

- Recommended Locations for Secondary Centres
- Alternative Locations for Secondary Centres
- ▨ Potential Location for "District" Centre



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centre, but might contain a swimming pool, skating rink, or gymnasium and squash courts. The outdoor facilities could include baseball fields, a football/soccer field and track, lawn bowling, courts for tennis and other games, gardens and/or landscaped areas.

Higher density housing and special housing for the aged or other groups also could be arranged around and within the centre.

These facilities in total will represent a significant source of local employment, which could amount to some 400-500 jobs.

With this range of programs and facilities in the centres, a focus also can be established for community activity such as local residents groups, adult education, voluntary social organizations, and other formal and informal events. These will be fundamental to the vitality and viability of these centres.

### 3.23 Area and Layout

A typical secondary centre might cover 25 ha (60 a). (See Table 3.20) Recreation land — including both the community park and high school — will cover more than half this area. Another large space user will be car parking, which for all the facilities could require as much as 6 ha (15 a) of land.

Buildings will account for 35,000 m<sup>2</sup> (400,000 ft<sup>2</sup>) of floorspace, or about 2 to 3 ha (5 to 7½ a) of the site area, assuming some two-storey development. Of this, roughly half will be in the high school. With the limited amount of actual physical development in the centres, their design will require special care if the facilities themselves are to be properly interrelated and linked to neighbourhood housing. (See Figure 3.23.)

All of the facilities of each centre have been grouped within one corner of the arterial intersection. This arrangement, in providing the opportunity to interrelate all of the uses, can offer a number of important benefits:

- 1) A compact car-free and sheltered environment can be created, in which all facilities are within immediate walking distance of each other.
- 2) The facilities can be used and shared by many different groups. For example, indoor recreation facilities can be located where they will be readily accessible to shoppers and high school students, and near associated outdoor facilities.

- 3) Public transit can be provided with a single and central focus, which will encourage patronage and reduce car usage.
- 4) By encouraging public transit and the shared use of car parking, the area devoted to cars can be kept to a minimum. By concentrating this provision, it can be also more readily laid out in an attractive manner.



### 3.23 Secondary Centre Layout

### 3.24 Phasing and Growth

All of the early major facilities — whether regional or local in scale — have been concentrated in the town centre, in order to foster its growth and develop a single dominant focus to the community.

The first separate secondary centre can be expected after the town has grown to approximately 20-30,000 persons. Its timing will be probably determined by when the community needs a second large supermarket or a full high school. In any case, this centre should not be developed until a department store and associated higher-order comparison shopping are located in the town centre, thereby establishing the pre-eminence of the town centre in the region and town.

If developed at the proper time, these secondary centres should complement rather than compete with the town centre. First of all, they will accommodate uses like high schools and community parks that require relatively large sites; and other uses like supermarkets that generate a disproportionately high amount of traffic. Furthermore, they provide smaller-scale nodes that are more readily accessible and more suitable for local activities within the residential fabric of the community.

Each centre can be expected to have its own character. Although a typical range of facilities has been listed, these will change as new requirements emerge over time and the different local needs develop. Furthermore, each site will have special characteristics that should be reflected in the design.

The number and distribution of the secondary centres also could change. The proposals primarily are based upon the present catchments of supermarkets and high schools. These could be modified by changing marketing conditions or different school policies.

Flexibility has been provided in the plan to accommodate changes by not tying the proposed secondary centres to fixed catchment areas, and by incorporating the possibility of developing other sites. This flexibility will be important for the western part of the town, because of its probable late development.

A possible site also has been indicated for a special secondary centre that could be developed in the long term. (See Figure 3.20.) This is a "district" centre anchored by a discount department store. Based upon current retail practices, this store will require a larger catchment of 30-35,000 persons, and be oriented primarily toward patrons using cars. It could be linked with other automobile-oriented outlets like automobile dealers, building suppliers, furniture stores and many uses normally associated with "strip commercial" areas.

### 3.30 Public Transit

The transit planning in Phase II concentrated on identifying the role of transit in Townsend, and formulating planning principles for the strategic plan. In this phase of the study, a conceptual routing system has been developed, and some of the main operational issues examined. The staging of transit also has been considered.

### 3.31 Transit Policies

The transit system as planned for Townsend will use buses operating scheduled services generally on the normal roadways to serve the entire built-up area. The use of demand-responsive "dial-a-bus" services probably will be limited to off-peak periods, perhaps in the evening, or during the initial stages of development.

The public transit in Townsend has been planned as a public service, to provide an attractive means of transport for the many people without any alternative, and furthermore, to lessen the general reliance of others on car transport. At the same time, the planning has attempted to balance what the community might want with what it might be able to afford.

Given Townsend's context, an average of 5 to 6% of the total daily trips could be reasonably expected, unless energy shortages or other factors increase transit ridership. The system can accommodate — and indeed has been planned to encourage — greater transit usage.

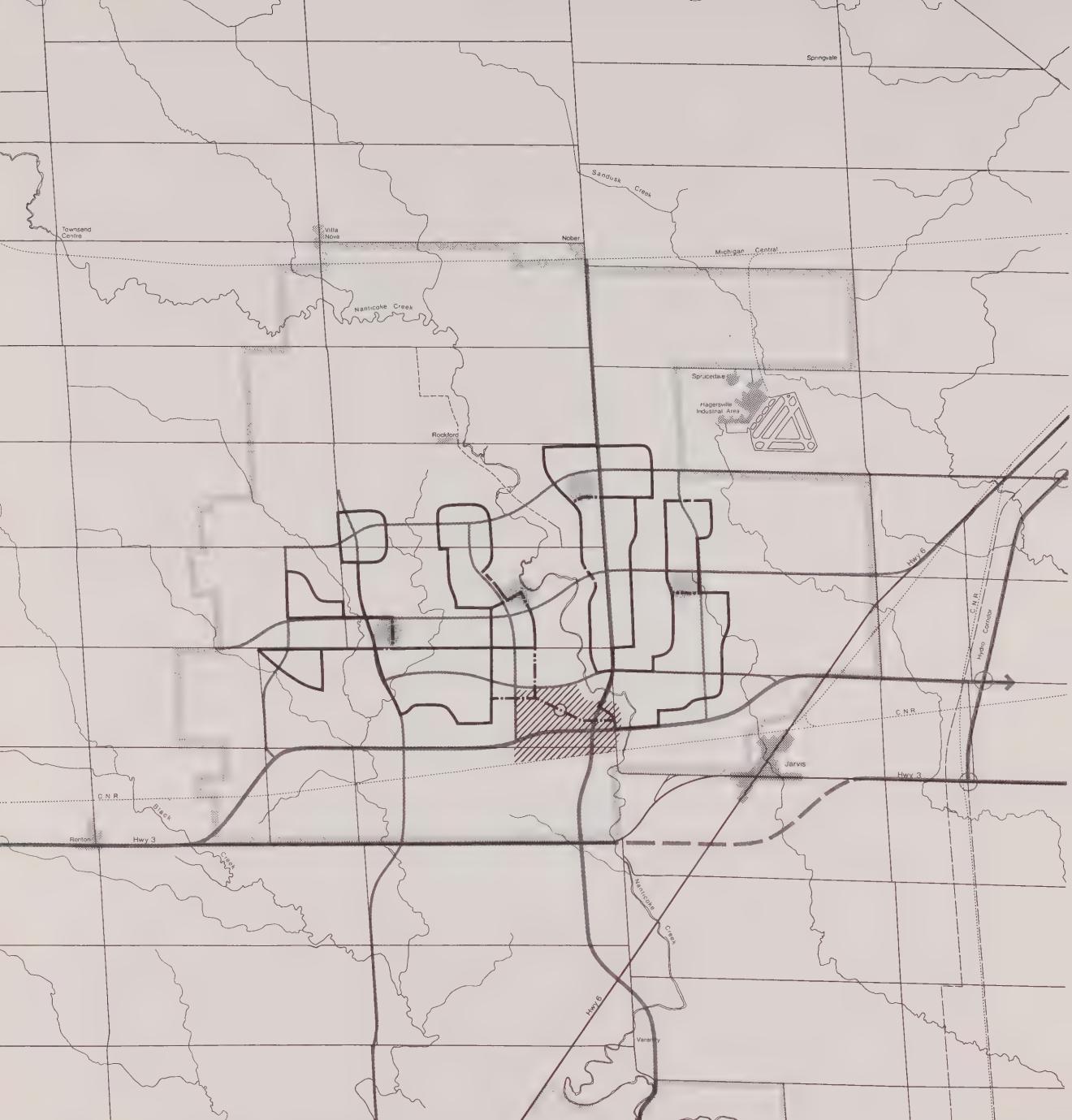
The layout of the community has been planned in conjunction with transit in order to provide not only good accessibility on direct routes, but also high operating speeds. The latter is especially important to minimize operating costs, and thereby, the public subsidy.

### 3.32 Recommended System

#### Routing configuration

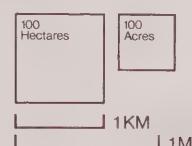
The proposed routes are based upon a radial network of scheduled services and focused on the town centre. (See Figure 3.30.)

The town centre will have the largest concentration of services and jobs in the community. Therefore, it will be the single most important destination for a variety of trips throughout the day. The centre also will contain a transit passenger terminal, where transfers can be made between all local and regional services.



## Potential Bus Services

- Town Routes
- Bus Only Lanes
- Bus Only Links
- Central Bus Station
- Secondary Centres
- Town Centre



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The preferred configuration for each radial route is a "figure of eight" with the secondary centre in the middle and the town centre at one end. Each "figure of eight" will have a two-way bus service.

At the 100,000 population level, however, this double two-way loop cannot be used exclusively because the total travel distance to the westernmost housing areas will be too long to meet operational requirements. In this case, a single two-way loop between the town centre and the secondary centre will be used, with a transfer required to local services to the more peripheral housing areas.

In all cases, however, the distance from the edge of the community area to the town centre will be covered within 15 minutes on a regularly scheduled service.

After completing one of these services and stopping at the town centre, all buses will also proceed on a similar service run on the other side of the Nanticoke, in order to accommodate the cross-town transit trips.

The bus services have been routed mainly on the residential collector roads. Most residential activities, like local shops and elementary schools, and higher density housing, will be located along these roads. In general, the routes have been laid out to be as direct as possible, while also providing a service within a maximum of 400 m (1,300 ft) and generally 300 m (1,000 ft) of every home. Higher density housing will be within 200 m (650 ft).

#### Preferential treatment

The residential collector system has been laid out to assist public transit. These roads have been spaced wherever possible to provide the accessibility noted above. The collectors are also continuous across the arterials so that buses running from one housing area to the next need not turn onto the arterials. These measures will not only reduce operating costs, but also improve the attractiveness of the service by minimizing passenger travel time. (See Section 3.15.)

The residential collector road system, however, cannot be laid out to entirely suit public transit. This would create extra road links, which in some places would permit extraneous traffic to run through the housing areas.

To facilitate bus movement, therefore, special bus-only links may be required in certain places (see Figure 3.30) to "short circuit" otherwise circuitous routes on normal roadways. Typically, these may require a short bus link between two separate local streets or alongside a pedestrian/bicycle path or arterial road.

Some form of preferential access for transit — like bus-only lanes or special turning privileges — may eventually be required in areas of intensive activity including the town centre and the secondary centres. Preferential treatment will increase not only operational speeds, but also general accessibility by allowing the bus to penetrate to the centre of activity.

A central circulation spine has been planned through the middle of the town centre. The spine will be an open-air route shared primarily by pedestrians and buses, and to a lesser extent by public service vehicles and perhaps taxis on a controlled basis. (See Section 4.40.) This route will run directly past most of the main facilities in the town centre, and within five to ten minutes walk of the most remote part. All internal services will travel along this route; and hence, a bus might be expected every five minutes or less for quick trips within the centre. To gain access to this route, the buses could share the pedestrian and bicycle link from the neighbouring housing areas that will pass under the arterial roads surrounding the centre.

Similar measures, although on a more limited scale, may also be required at the secondary centres.

In the past, the justification for priority treatment has been based solely on passenger volumes. Instead of this measure, it should be based on the trade-off between the capital costs of providing the treatment and the resulting annual operating costs. With proper forward planning, the capital costs of these measures can be minimized in the new community.

Separate bus lanes are not likely to be needed outside the town centre because the planned road system should limit the incidence of traffic congestion, and the transit volumes on any route will not be high enough to justify the additional cost.

#### Performance characteristics

A comparison can be made between the proposed system and that of existing communities of a similar size in Ontario using various performance characteristics. (See Table 3.32.)

Most communities provide some financial support for transit service. In communities of 100,000, the range of support is 33-65%, and the average is about 50%. The estimated subsidy levels needed for the suggested routing will be near the average.

The annual revenue miles/capita is approximately a third lower than average, although the level of service provided by the planned system is quite high. This

reflects the directness of the suggested routing system and the compactness of the community structure.

Table 3.32: Potential Performance Characteristics of the Recommended Service

Average annual weekday passengers <sup>1</sup>	12,000
Maximum number of vehicles in service	20
Number of routes <sup>2</sup>	4
Annual revenue miles <sup>3</sup>	870,000
Revenue miles/capita	8.7
Annual revenue passengers <sup>1</sup>	3,500,000
Annual fare revenue <sup>4</sup>	\$875,000
Annual cost	\$1,200,000
Annual subsidy required	\$325,000
Subsidy per passenger	\$0.09
Subsidy per mile	\$0.37

<sup>1</sup> based on average annual ridership of 35 trips/capita

<sup>2</sup> comparable to 10 fixed routes terminating in town centre

<sup>3</sup> weekday and Saturday service only; no service assumed on Sundays and holidays

<sup>4</sup> based on average fare of \$0.25 per passenger

### 3.33 Special Services

#### Industrial transit

The provision of a transit service from Townsend to the Nanticoke industries must be examined further. This service to Nanticoke from Townsend will be the responsibility of a municipal or regional authority, and must be planned in conjunction with similar services to other communities. The initial Townsend residents should be periodically surveyed to assess public interest in this service and to determine the likely travel pattern.

Past experience in providing industrial services as part of the regular town system has been discouraging. A basic routing system focused on the town centre cannot provide direct service to the outlying industrial parks. Most development in new industrial areas is spread out to accommodate future expansion as well as sufficient parking for all employees. In addition, car pooling can produce comparable user costs, while approximating the convenience of individual automobile use.

Any service to Nanticoke, therefore, must be particularly direct and convenient to attract ridership. One possibility is an independent express service linking only the town centre and secondary centres to the industrial areas, and with the riders collected in the housing areas by the local town services. Alternatively, the industrial employees may wish to organize their own services, for example, using small buses for which they share the driving and upkeep.

#### **Handicapped transit**

Services for the physically or mentally handicapped are difficult to combine with the regular transit operation because of the physical problems and the specialized nature of the demand. Special services should be provided, but by the agency operating the regular town service in order to minimize overall operating and capital costs.

#### **Regional transit**

A regional authority does not presently exist to plan or operate transit. However, regional bus services between Townsend, Simcoe and other major communities probably will be started as the population of town and region grows. It is expected that these services will operate on the regional highways and stop at a single location in each community.

In Townsend, these services can stop at the central bus terminal within the town centre. Access can be conveniently made to the town centre along one of the arterials directly from highway 3 and highway 6.

### **3.34 Transit Phasing**

While the transit planning has focused primarily on the ultimate population level, the policies and proposals recommended for this stage should be generally applicable to the earlier periods of development.

A transit service using buses should be capable of systematic expansion as long as the community is developed in a continuous and compact manner, and with logical extensions of the existing roads. Nevertheless, with the community under constant expansion, the entire transit program must be carefully planned, and the local road system always laid out with the needs of transit in mind.

#### **5,000 population**

No internal service should be required at this time, considering the short travel distances and local activity level. If service was provided at this time, however, it could be readily looped through the community along the planned collector roads.

Any regional services can be readily routed through the community along the east-west concession road and Townline Road, stopping probably at the initial activity centre.

The provision of industrial service at this time from Townsend to the Nanticoke industrial area will depend upon demand. It could be an express service, with a single stop in Townsend at the initial activity centre, and a route either down Townline Road or over to regional road 55.

#### 20,000 population

Between the 5,000 and 20,000 population levels, a transit service would not normally be provided. However, it may be considered necessary to promote the town or encourage the use of public transit. For these purposes, consideration should be given these two options:

- a private taxi service subsidized to maintain low fares within the community for the young and those on fixed income;
- a demand-responsive "dial-a-bus" service used as a transition system toward a regular scheduled service.

At or shortly after 20,000 persons, a regular scheduled service should be implemented, especially when major facilities like a supermarket and a high school are developed. The routing configuration could be a "figure of eight" or "dumb-bell" loop, running on the residential collectors, focusing on the town centre, and with one of the loops servicing each side of the Nanticoke.

As in the 5,000 plan, any special industrial service probably would be an express service stopping only at the town centre. The internal bus service could be used to collect riders in the housing areas.

Any regional service, as before, can be readily accommodated on the planned road systems to the town centre.

### 3.40 Engineering Services

Preliminary sanitary drainage, water supply and storm water systems have been designed as part of the strategic plan. These relate to the regional services as presently planned, and will provide a context for detailed designs to be undertaken for the initial development areas.

#### 3.41 Sanitary Drainage

##### Regional system

The new regional sanitary drainage system will serve Jarvis, Hagersville and Waterford as well as Stelco and Townsend. In the recommended layout, a central trunk sewer from the regional water pollution control plant on Lake Erie will be laid between the Nanticoke and Black Creeks up to the southern boundary of Townsend. (See Figure 3.41)

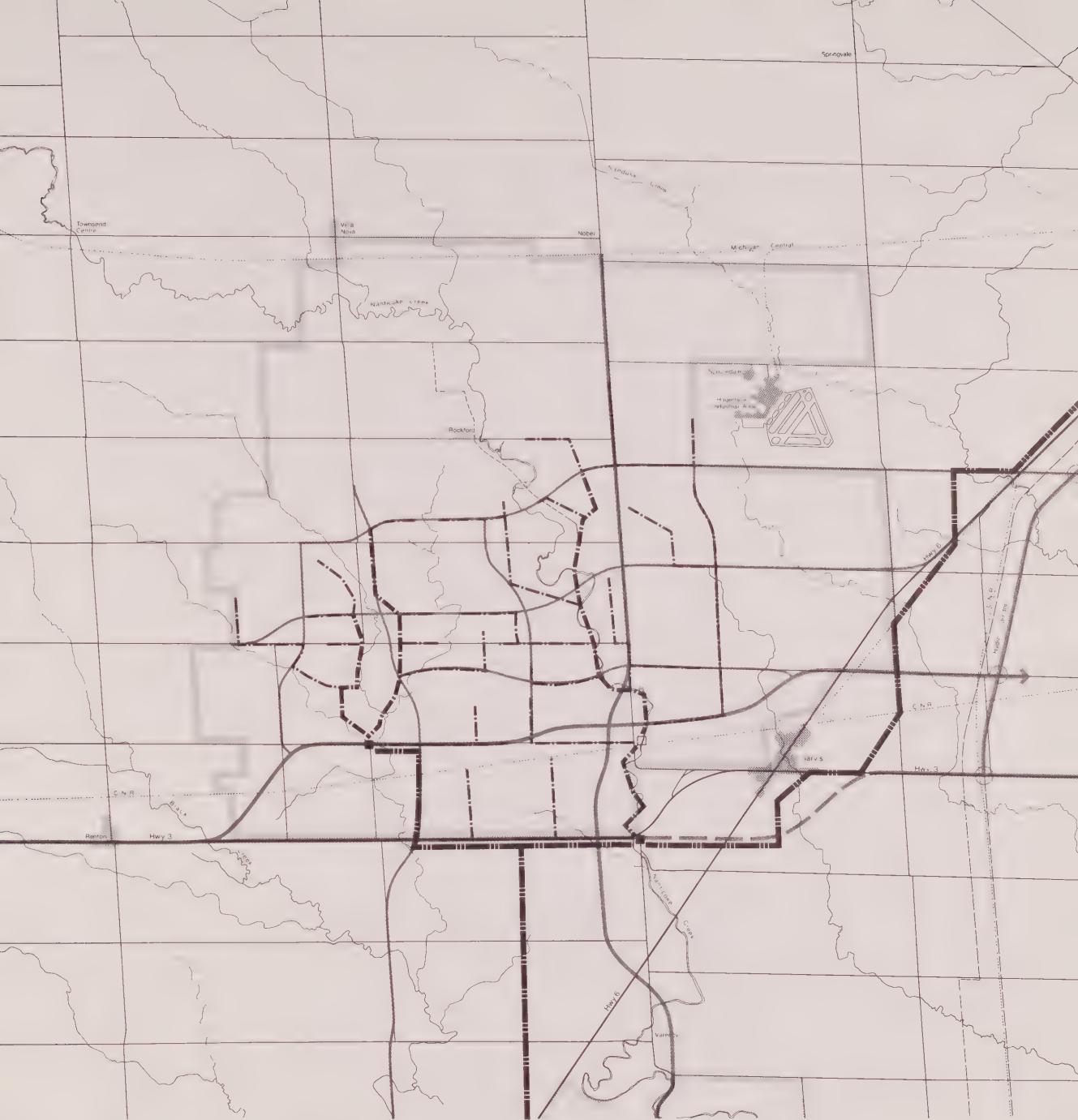
The two pumping stations along the southern boundary of the site will pump the sanitary effluent along force mains to the trunk. The pumping stations in the Nanticoke Valley will serve Jarvis and Hagersville as well as the eastern part of Townsend. The station in the Black Creek Valley will serve Waterford as well as the west part of Townsend.

The Nanticoke pumping station, as presently planned, will be located near highway 3 in order to receive the sub-trunk from Jarvis and Hagersville. Consideration should be given to locating it further north, perhaps near the CN rail line. This location will eliminate a considerable length of construction into bedrock and along an attractive and environmentally sensitive valley. The forcemain to the head of the trunk sewer can be routed along the new road system.

##### Townsend System

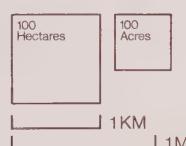
The preliminary sanitary system for the new community has been planned as a gravity system. It consists of three sub-systems based upon a sub-trunk in the Nanticoke valley and two in the Black Creek. The sub-trunks have been placed within the creek valleys so that the entire system can take full advantage of the natural slope of the ground to drain the site with a minimum of excavation and pumping.

The Nanticoke sub-trunk will serve the natural watershed of this creek, the developed area eastwards up to the Sandusky Creek, and part of the area westwards in the Black Creek watershed. The Black Creek sub-trunks will serve the natural watershed of this creek, except the area served by the Nanticoke system.



## Sanitary Drainage System

- Regional Trunk Sewer or Force main
- Townsend Sub-Trunk Sewer
- Townsend Collector Sewer
- Present Location for Pumping Station
- Alternative Location for Pumping Station



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Each of the sub-trunks will be served by a series of collector and local sewers. The generally flat terrain provides considerable flexibility for laying out these sewers. Staging will have an important influence on their location. Wherever possible, the sub-trunk and collector sewers should follow roads and walkways.

A detailed examination must be made for all of the sub-trunks, and especially the one for the Nanticoke watershed. The preliminary route for a single sub-trunk along the Nanticoke valley has been tentatively selected, on the basis of 1:2000 mapping with  $\frac{1}{2}$  m contours and an initial inventory of vegetation along the valley. In general, the route follows the low-lying valley in order to minimize excavation. The route also avoids all major natural slopes, and all significant woodlots and vegetation.

The alignment does cross the creek in three places, in order to avoid the major slopes and vegetation. The Ministry of Environment has prepared a detailed series of safeguards\* to prevent environmental damage while constructing these stream crossings. These crossings, which will take 2 to 4 days to construct, should be made at periods of minimum flow during the summer or winter. To control scour and sedimentation, the stream course should be damned upstream, and the water pumped around the construction. A stilling basin also should be made downstream to receive the pumped water, and any other silty water during and after the construction. The bottom of the stream course also should be reinstated with proper materials.

The route of this sewer, which should be also suitably graded and landscaped, has been used as part of the major pedestrian and bicycle system along the Nanticoke in the planning proposals.

On the basis of this preliminary design, the single sub-trunk along the valley appears to have the least overall costs for serving the Nanticoke watershed because it minimizes excavation and pumping costs. It also appears that the sub-trunk can be constructed without causing major or permanent environmental damage. Nevertheless, before any of the sub-trunks are developed, they must undergo pre-engineering design, which will include a detailed costing and environmental assessment — including the potential impact of the construction work.

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\* Environmental Assessment Section, Environmental Approvals Branch, Ministry of Environment, "Environmental Considerations for the Planning and Construction of Provincial Sewer and Water Projects (First Edition)", February 1977.

During the pre-engineering design, further consideration will be given to these two main alternatives:

- 1) Providing two sanitary sub-trunks along each side of the Nanticoke Creek, approximately paralleling the valley but routed through the development along streets and other features. The two sub-trunks could start near the Townline Road crossing of the Nanticoke; below this point, a single trunk sewer would probably be provided as reviewed above. While this alternative will lessen any potential for environmental damage, the construction costs will be significantly higher because of the deeper excavation needed along the tableland to achieve the required sewer levels.
- 2) Pumping along selected lengths of the sub-trunk or collectors. While this will reduce the excavation costs, the trade-off will be a substantial increase in operating costs.

The eastern half of the potential industrial area in the northeast corner of Townsend, which falls within the Sandusk Creek watershed, cannot be served by the Nanticoke sub-trunk without lowering the system by up to  $4\frac{1}{2}$  m (15 ft), penetrating the bedrock in some sections. Therefore, provision probably must be made for draining this area to the Hagersville trunk at the east boundary of Townsend by filling the low-lying areas of the Sandusk valley, pumping locally and/or lowering the Hagersville trunk sewer.

The initial development, up to a maximum of 7,000 population, could be served by a temporary stabilization pond situated between the two creeks north of highway 3. A temporary pumping station will be required to pump the sanitary effluent via a forcemain to the ponds; subsequently the forcemain will link directly to the regional trunk sewer. The temporary pumping station can be located alternatively where Townline Road crosses either the Nanticoke Creek or the CN railway. The latter location may also be the location of the permanent Nanticoke pumping station.

### 3.42 Water Supply

#### Regional system

The new regional system will supply water from the new treatment plant above Lake Erie to Port Dover, Jarvis, Hagersville, Stelco and Townsend.

Three alternative routes are being considered for the trunk main to Townsend. The first is routed centrally between the Nanticoke and Black Creeks, with a ground storage reservoir and booster pumping station situated

on the southern edge of Townsend. The second, which is a variation of the first alternative, aligns the trunk along Townline Road. The third routes the trunk main along the hydro right-of-way to the east of Jarvis with the reservoir situated at the eastern boundary of the Townsend site.

In developing the Townsend system, the first alternative has been used. The central alignment provides a more secure system, and greater flexibility in the staging of development. (See Figure 3.42.)

As part of the regional system, an elevated water tank is also needed in Townsend near the centroid of development.

#### Town system

The principal feature of the proposed water network is a central ring main, supplied at two points from the ground reservoir in the southern industrial area. The ring main and the principal components of the proposed network will follow the main road and walkway system.

The first development at Townsend will be supplied directly from the new treatment plant. The elevated tank west of the Nanticoke valley will be constructed prior to first development in order to provide security of service during this period. The ground reservoir and associated pumping station will not be provided until later when required by demand.

#### 3.43 Storm Water System

Townsend extends over the watersheds of three creeks: the Sandusk, Nanticoke and Black. The latter two stream courses will be used, as much as possible, to take the storm water run-off from the new community.

Storm water management has been adopted for the storm water drainage of Townsend. This approach is intended to control the run-off from the developed area so that the flow discharge to the natural watercourses does not substantially increase the rate of erosion, or the frequency and magnitude of flooding downstream.

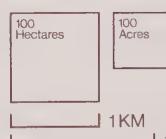
#### Drainage systems

Two storm water systems are planned — one using underground pipes and the other surface drainage. Both will drain to retention storage facilities, which will regulate the subsequent discharge into the natural stream courses. (See Figure 3.43.)



## Water Supply System

- [Dashed Line] Regional Trunk Main
- [Solid Line] Townsend Ring Main
- [Dash-Dot Line] Townsend Water Main
- [Black Circle] Elevated Tank
- [Black Square] Pump Station
- [Open Circle] Ground Storage Reservoir

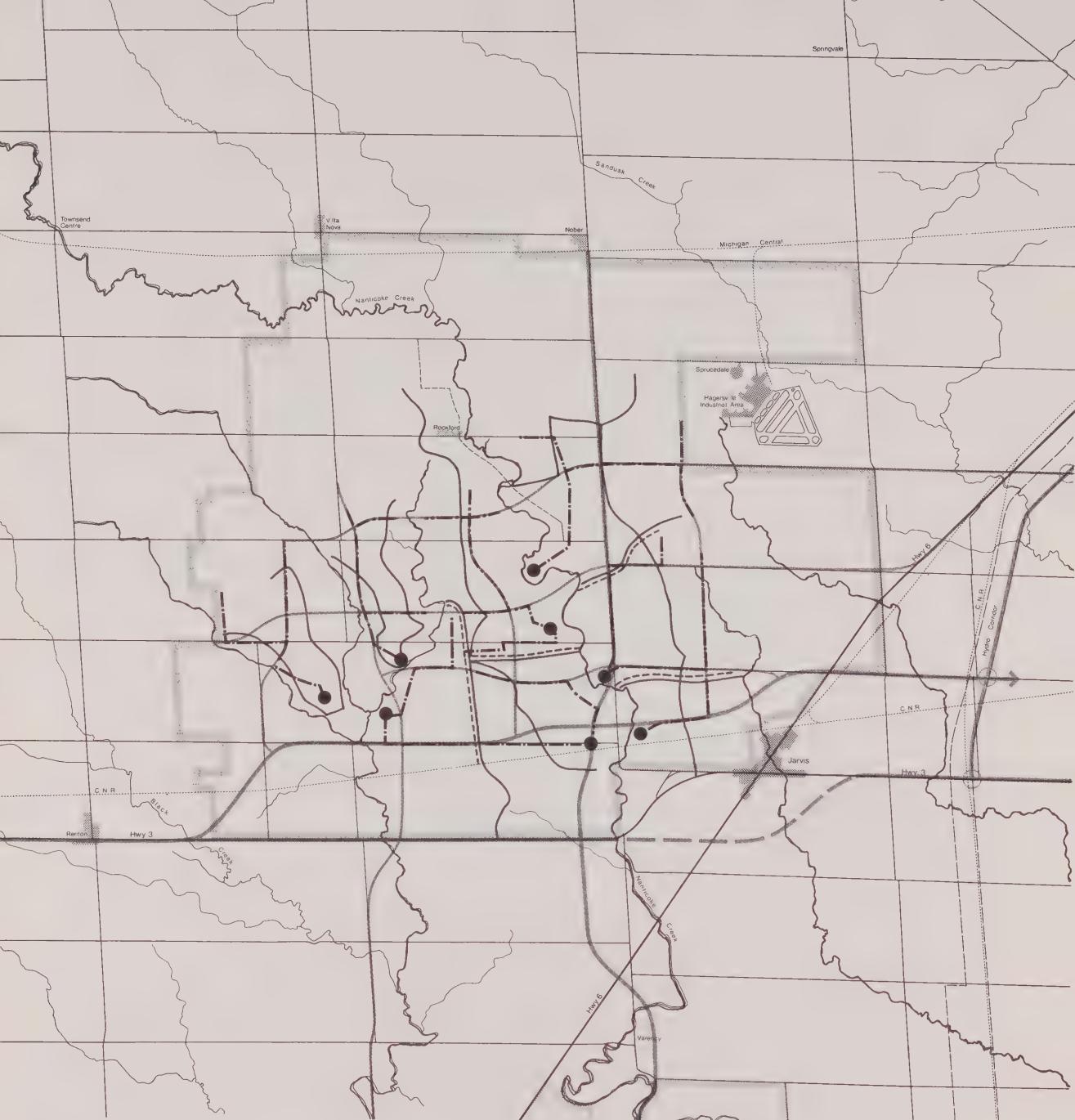


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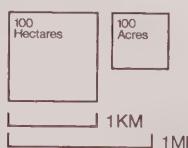
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## Storm Water Drainage System

- Major Watercourse
- Storm Sewer
- Retention Facility
- Watershed Boundary for Piped System
- Watershed Boundary for Surface System



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The underground system will consist of the sewer pipes for rapidly removing storm water from public areas like roads, sidewalks, play areas and car parks. This system has been designed to accommodate the relatively small storms of frequent occurrence (one in two years). The surface system will accommodate the storm flows exceeding the capacity of the minor system and resulting from a major storm of relatively infrequent occurrence (up to once in 100 years). These flows will be routed in a system of designated surface routes along roads, walkways, linked open spaces and drainage easements.

In the piped system, the development area has been divided into eight sub-drainage areas, each served by a retention pond. Five of these will drain to the Nanticoke, three into the Black Creek and none into the Sandusky. The eastern Nanticoke sub-drainage areas have been extended eastwards to include the development within the Sandusky watershed. The northern of two sub-drainage areas west of the Nanticoke also has been extended to the valley of the Black Creek.

The surface run-off also will be taken where possible to the eight retention facilities, but some sloping areas adjacent to the existing creeks will drain directly to a natural watercourse.

A conceptual piped system has been planned, providing a separate collector and associated local sewers for each of the eight sub-drainage areas. The collector sewers will generally follow the arterial and major collector roads, while the local sewers will follow the local and minor collector roads. Routes along walkways also could be used when they require less construction depth, particularly in the downstream sections where larger pipe sizes are required.

The designated channels of the surface system can be laid out as development proceeds. The topography allows considerable flexibility for locating these routes.

The Sandusky watershed within the development area is essentially flat. The difference in elevation between the "top of bank" and the bed of the stream at Jarvis is approximately 3 m (10 ft). The gradient provided by this difference is insufficient for a gravity piped system with storage retention facilities. For this reason, development within the Sandusky watershed has been limited to the area that can be served by the Nanticoke system.

The storm water systems for the industrial areas must be considered in greater detail. In general, every industrial parcel should provide site storage on roofs, car parks and/or landscaped areas. This should be supplemented by local "dry" retention basins. In order to reduce the depths required for these retention basins, drainage swales and small channels should be used as much as possible. The outflow from these retention basins then could be accommodated in underground sewers leading to the stream courses.

### Retention facilities

The function of the retention facilities is to store the increased storm water run-off from the developed area so that the peak flow rate after development does not substantially increase the erosion and flooding potential downstream.

A suitable location for the retention facilities in each of the eight sub-drainage areas has been identified. These utilize generally natural depressions or valleys formed by small tributaries at their outlets to the main stream courses.

The eight main retention facilities are planned as "wet" basins with permanent ponds 3 to 5 m (10 to 16 ft) deep. The additional capacity needed for storm water storage will be accommodated temporarily in the basin above the normal water level. With suitable landscaping these ponds can be used for passive recreation activities and as general amenity features.

For the areas where the surface run-off will drain directly to one of the watercourses, additional "dry" storage facilities may be required. Subject to environmental assessment, these could be provided by a small dam approximately 2 to 3 m (6 to 10 ft) high across a tributary valley.

No retention facilities for the piped system are proposed for the Sandusk Creek as this area will be served by the Nanticoke system. However, surface flow from most of this watershed will drain to the stream course. To control the discharge, shallow retention areas can be formed in the extensive floodplain areas of the creek using earth embankments approximately 1 to 1½ m high. A total of approximately 50 ha (125 a) storage could be required with storage depths of approximately ½ m (1½ ft).

The possibility of introducing shallow retention basins or depressions within neighbourhood parks also should be considered. These could take the form of ½ to 1 ha (1 to 2 a) depressions 4 m (13 ft) deep, with turfed flat bottoms for such active recreation facilities as baseball diamonds. They could significantly lower costs by reducing the size of the retention facility required next to the major watercourses, as well as the pipe sizes of the intervening underground system.

### Cost considerations

The management of storm water by retention facilities is a new approach in Ontario. The provincial requirements are presently in guideline form. Therefore, many aspects of this approach must be explored in greater detail.

Several design features in Townsend have been identified that will require higher than normal capital expenditure for the drainage system.

- 1) The pipe sewers must be installed with minimum gradients because of the shallow relief throughout the development area. This will require larger pipes and deeper trenches than normal.
- 2) The retention facilities will require considerable excavation because of the deep outlet levels of the piped system. The ponds located along the southern part of the Nanticoke Creek, furthermore, must be excavated from bedrock.
- 3) The piped system for the Nanticoke must be extended into the Sandusk because of minimal relief and shallow valley depth. This will cause additional construction cost by deepening the sewers required in the Nanticoke.
- 4) In some areas adjacent to the stream courses, the surface flows cannot be routed through the major retention facilities. Each of these may require small retention areas or catchbasins.
- 5) With the storage facilities located at the downstream end of the systems, the pipe sizes of the collector sewer system must be relatively large, unless retention areas also can be incorporated "upstream" in neighbourhood park areas.

While attempts have been made to minimize these costs, each of these features will require detailed analysis in the pre-design study.

The proposed storm water retention facilities may require special management to avoid environmental problems. High turbidity and siltation are likely. Water quality problems such as algae blooms, aquatic weed growth, insect production and health hazards resulting from low water quality also can be expected under certain conditions. However, these problems probably can be either avoided or minimized by appropriate design, monitoring and treatment of the retention facilities. This will add maintenance costs that should be recognized.

As the Townsend site does not contain an abundance of natural amenities, the retention ponds could serve to enhance the attractiveness of the site, and thereby aid in marketing the development. This benefit might be considered as partially offsetting the costs.



## 4.00 TOWN CENTRE

The studies in Phase II focused on defining the role of the centre, selecting its location, and finally, determining its possible size and contents. In Phase III, a conceptual plan has been prepared for the centre and its design potential and development program initially explored.

### 4.10 Regional Role

The town centre has the potential of being the heart of the new region as well as the new community. As such, it should contain most of the unique and one-of-a-kind facilities in the region; and therefore, provide the setting for the greatest diversity of goods, services, people and events in the area.

Concentrating most of the major activities in the centre is seen as a way of creating an early and strong sense of identity for the community and region. It should also create the best opportunity for establishing comprehensive comparison shopping in the region. This in turn should serve to attract a greater diversity of employment, and a higher level of other social and non-commercial facilities and services.

### 4.20 Site Description

The centre has been sited on the southern edge of the community, next to the Nanticoke valley and approximately 1 km north of highway 3.

The site will be served by two regional arterials on the south and east for access from the region, and by two town arterials on the north and west primarily for access from the community.

The area designated for the town centre covers approximately 110 ha (270 a). This area is larger than many regional centres for shopping only, but is comparable in size to many recent mixed-use centres.



## Site Conditions Town Centre

- Flood Plain
- Fill Line
- Woodlots and Hedgerows
- Historic Buildings: Grade 1
- Grade 2
- Other Buildings

- Regional Arterials
- Town Arterials
- ◀ Vehicular Access Points
- Retention Pond
- Regional Administrative Centre:
  - Agreed Site
  - Possible Extension
- R Initial Activity Centre
- Community College

150 M  
500 FT

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The site is relatively flat and featureless, which makes it suitable for large scale development. However, the Nanticoke provides a highly distinctive setting for many special developments. (See Figure 4.20.)

#### 4.30 Land Requirements

The centre should contain all the functions traditionally associated with a major "downtown" area, including cultural, social, recreational, entertainment as well as shopping and business facilities. With the associated build-up of service employment, it should be a major place of work in the region. The variety of activities also should make it an interesting and unique place to live.

The range and scale of facilities in the centre will be affected by many factors. For preliminary planning purposes, an initial list of possible land uses has been identified and their land requirements estimated. (See Table 4.30.)

Table 4.30: Land Budget for the Town Centre

	5,000 Population		20,000 Population		100,000 Population	
	Floor-space (m <sup>2</sup> )	Site Area* (ha)	Floor-space (m <sup>2</sup> )	Site Area* (ha)	Floor-space (m <sup>2</sup> )	Site Area* (ha)
Shopping Facilities	-	-	23,000	7	95,000	12
Offices and Other Commercial Space	4,800	2	34,250	9	58,000	10
Housing Development	(75 dw)	1	(600 dw)	8	(3,000 dw)	40
Community Facilities	1,700	1	9,400	3	47,500	11½
Open Space and Recreation Facilities	-	-	-	2	-	12
Circulation Infrastructure	-	1	-	6	-	13½
TOTAL	6,500	5	66,650	35	200,500	99

\* with associated car parking

The area required for the listed land uses could require more land than is available in the site, if all uses were built at the lowest possible intensity. However, this is not characteristic of recent comprehensive developments. Generally, an intensive "urbane" character was assumed for Townsend's centre, with building frontages related to one another along a street, some mixing and stacking of uses and sharing of car parking spaces.

On this basis, the land budget required for the listed uses amounts to nearly 100 ha (250 a). The land requirements will increase as more uses become known.

The main facilities, which have been reviewed in the Phase II report, include the following:

- comparison shopping facilities, with about 95,000 m<sup>2</sup> (1,000,000 ft<sup>2</sup>) of floor space for three or four department stores and associated specialty shopping;
- 3,000 apartment units for about 5,500 residents;
- miscellaneous office space, including regional administrative centre, new municipal offices, registry office, police headquarters, post office, social and health services and local professional offices;
- various other commercial and community facilities, including a hospital, hotel, library, bus depot, public high school and cinemas;
- leisure uses, including a civic square, indoor all-year sports centre, stadium and sports fields;
- car parking for approximately 10,000 vehicles.

#### 4.40 Planning Structure

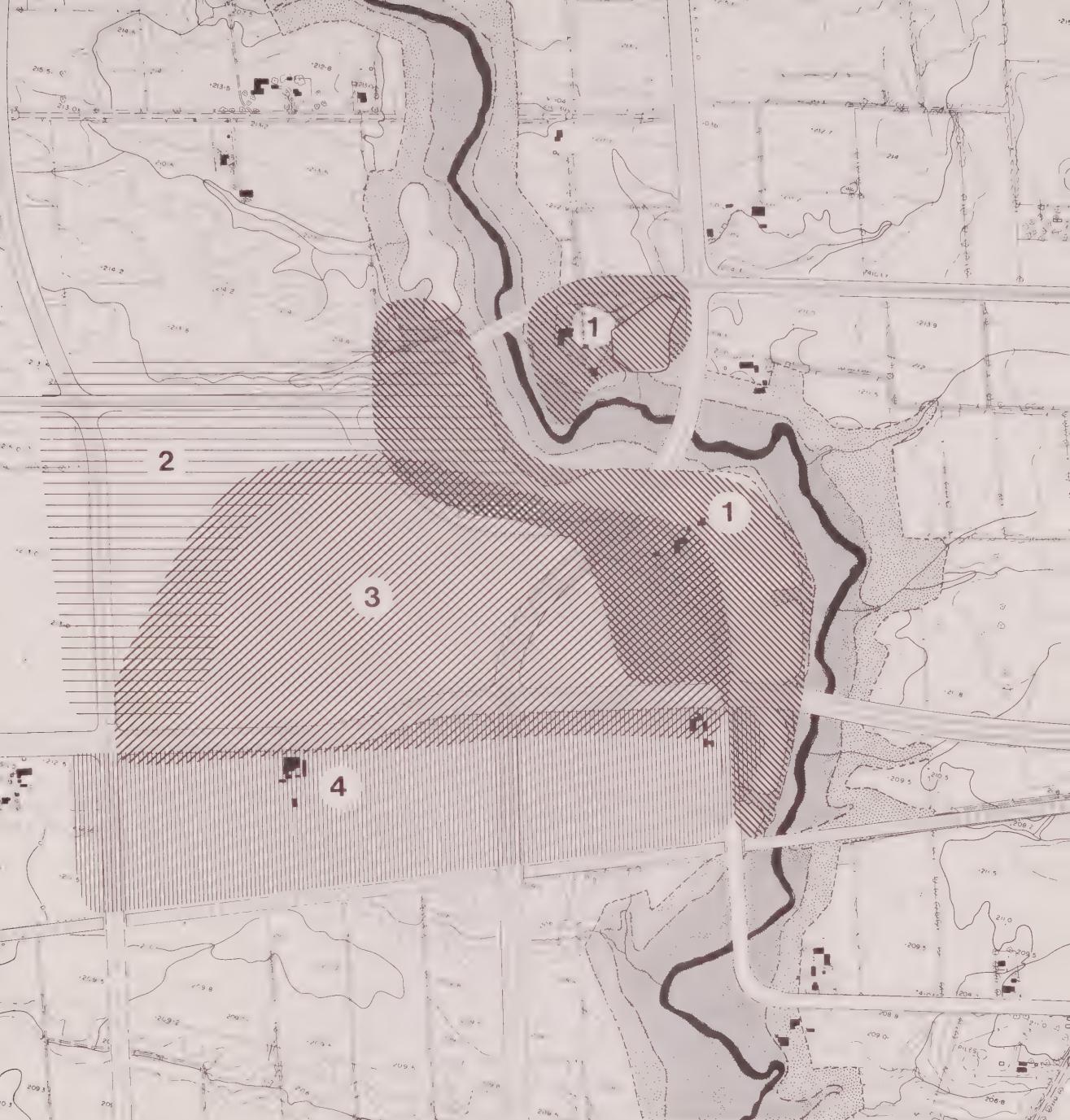
The centre has been planned as a mixed-use development. This approach is intended to create a downtown that is lively and exciting as well as economically viable through all stages of development.

#### 4.41 Activity Zones

The land-use pattern is organized around four broad activity zones. (See Figure 4.41.) Each activity zone contains a mixture of compatible uses sharing the same major locational characteristics. Some of these zones overlap and extend into adjacent development areas.

##### Zone 1: Valley Edge

The character of this zone along the Nanticoke should be governed by its relationship with this important landscape feature. There should be places to play, sit and talk or relax in the sun. Uses can include terraced high density housing, hotel, leisure facilities, cafes and prestige office developments. Many of these might be campus-type developments set in generous landscaping.



## Activity Zones

- 1** Valley Edge
- 2** Housing Interface
- 3** Commercial Core
- 4** Highway Campus

150 M  
500 FT



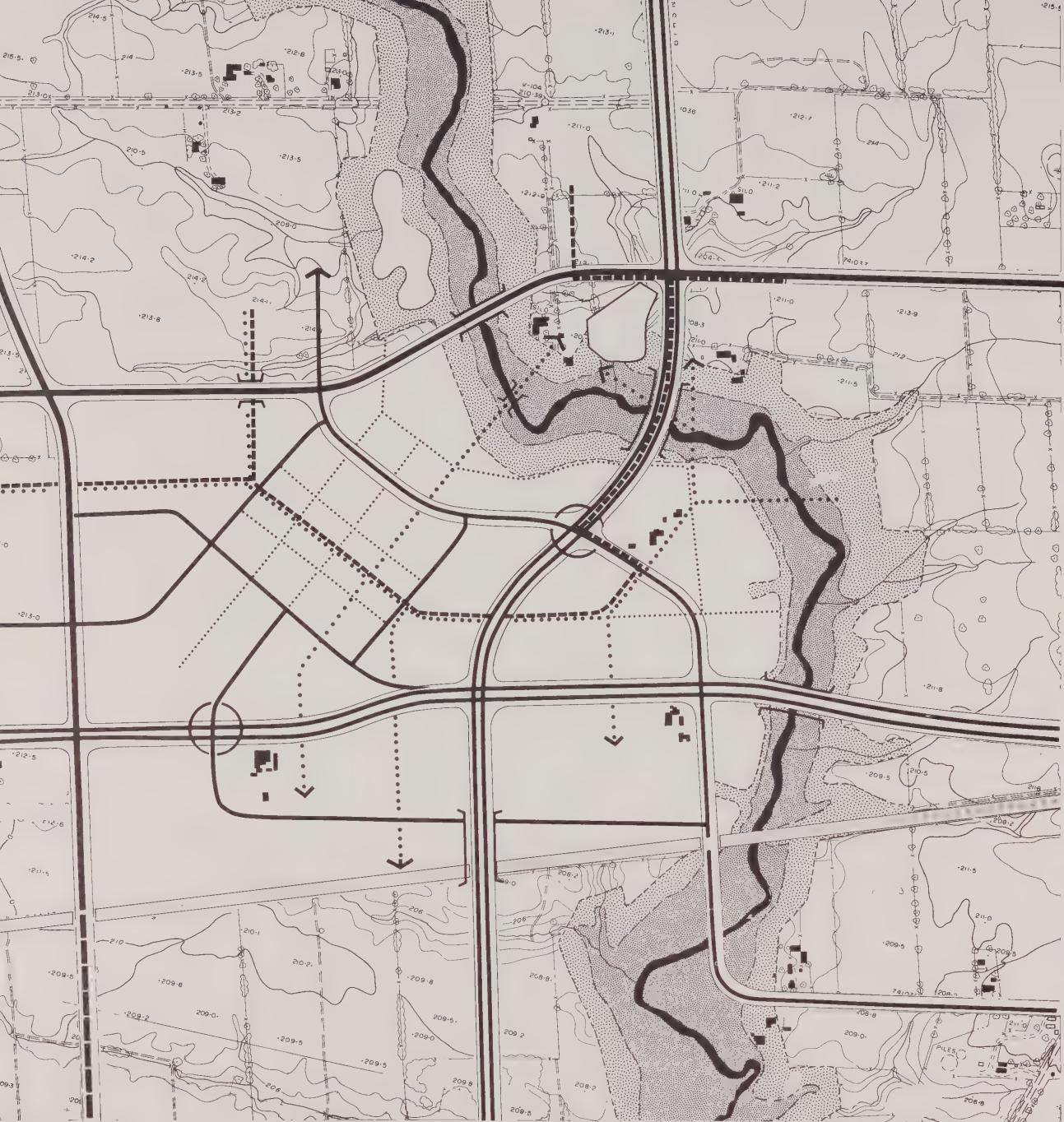
Date Apr. 77

# TOWNSEND

COMMUNITY DEVELOPMENT PROGRAM



Ministry  
of Housing  
Ontario



## Circulation Framework

- Distributor Roads
- Bus Transit
- Major Pedestrian Routes
- Secondary Pedestrian Routes

150 M  
 500 FT



Date Apr. 77

# TOWNSEND

COMMUNITY DEVELOPMENT PROGRAM



Ontario

### Zone 2: Housing Interface

This area on the northern and western edges of the town centre links the downtown and adjacent neighbourhoods. It should be a quiet and low-scale environment, with small squares and urban spaces. Uses can include a mixture of housing, local shops, professional offices, small work shops and studios, and cultural and community facilities.

### Zone 3: Commercial Core

This zone in the centre of the site has the highest degree of access and greatest intensity of use. It should contain the major public attractions: shopping, restaurants, entertainment — all uses which thrive in close proximity to one another. Generally, the area will be characterized by busy streets, bright lights, bustle, lively attractive frontages and closely spaced activities.

### Zone 4: Highway Campus

The fourth zone is associated with the regional roads. Uses would be more land-extensive in character, many requiring good automobile access, their own parking facilities, and less dependent on busy street life and casual trade. These include car dealers, hardware and building supply outlets, sports fields and stadia, institutional complexes, service industries and showrooms.

## 4.42 Circulation Framework

### Roads

The town centre will be served by four arterials. These will allow through traffic to bypass the centre, while also providing convenient vehicular access to all parts of the centre. Access points to the centre from these roads have been spaced by operational considerations at intervals of 250-300 m (800-1,000 ft). (See Figure 4.42.) The need for grade-separated entries must be examined further.

The roads leading to the town centre have been treated as visual gateways. The first views into the centre, especially from the intersection of Townline Road and the southern east-west arterial, must present an inviting image. They should also provide the approaching motorist with a clear sense of orientation to the major components and internal circulation system of the town centre.

The internal distributor road system is based upon a loop around the main commercial core. This road is linked to the surrounding arterials and provides direct access to the main car parks, service areas and local

roads. The system will be used primarily by private and delivery vehicles, as pedestrians, buses and bicyclists will be accommodated elsewhere.

A network of local roads will provide access to the buildings and small car parks. These roads will accommodate private cars, taxis and smaller delivery vehicles, as well as sidewalks for pedestrians.

Emergency vehicles will have access to all distributor roads and pedestrian streets.

#### Parking

The major car parks have been located directly off the distributor road system. Short-term parking can also be located along the local streets.

The parking areas have been organized for shared use by locating them near a variety of activities. The larger lots have been based on 250 car units, a size that can be compatibly integrated with the associated pedestrian-scaled development and allows for future structuring into decks.

#### Transit

The town centre will be the focus for all local bus routes and contain the central transit terminal where transfer can be made to regional services. (See Section 3.30.)

The local buses have been routed down the linear shopping spine through the middle of the town centre. The main transit route will be in an open-air arcaded mall for pedestrians and buses primarily, fronted on both sides by most of the main shops and other facilities.

#### Pedestrians

The central mall, noted above, also will serve as the spine to the pedestrian system throughout the centre.

The main pedestrian routes are independent of the distributor road system. They will link all the important uses within the town centre and to the adjoining housing areas. While the routes within the centre will be generally at ground level, convenient grade-separated links to adjoining sites have been indicated.

These main pedestrian routes will be supplemented by a tighter network of secondary links, generally following sidewalks along the local streets.

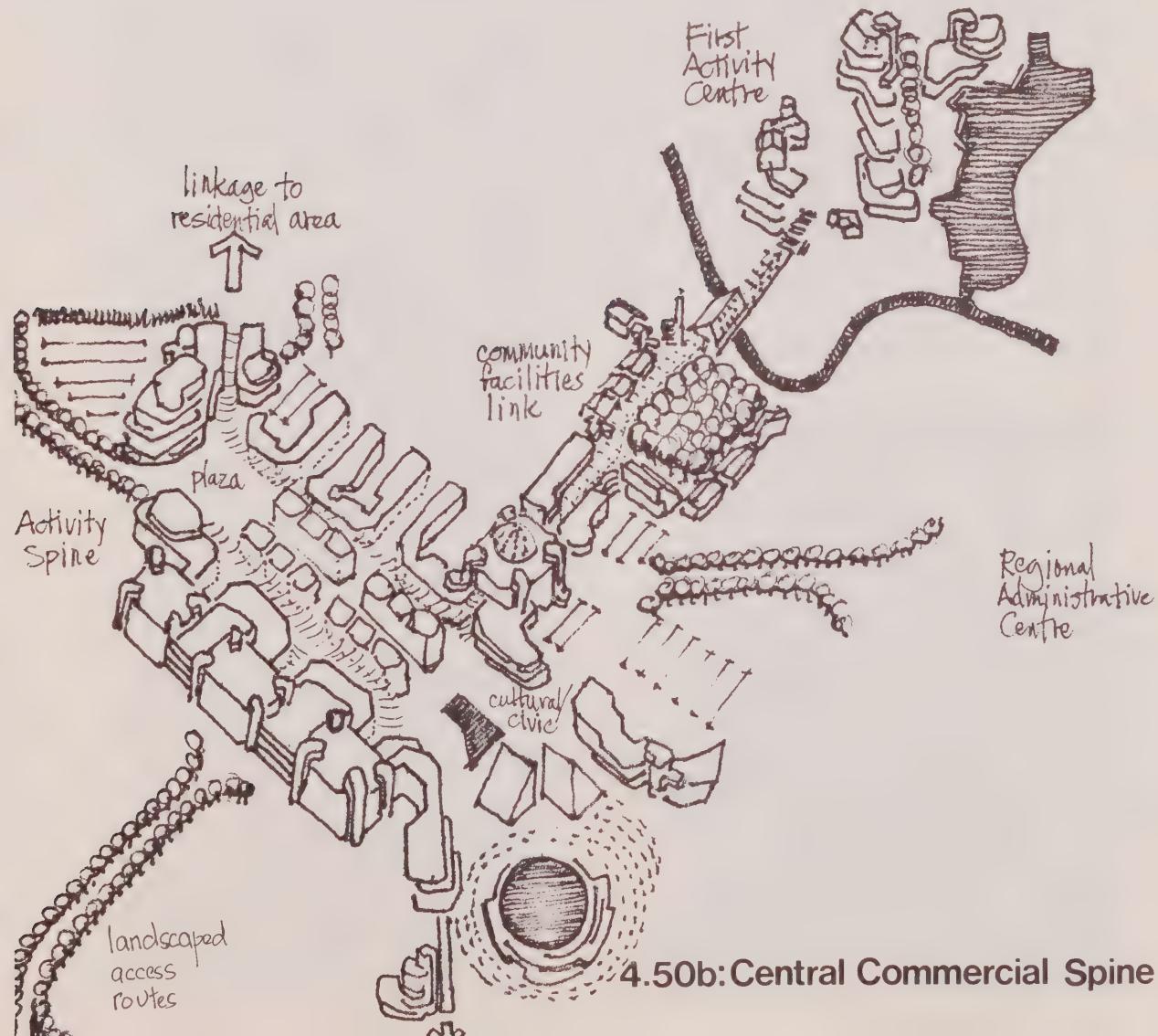
This system allows for creating a variety of pedestrian places: climate-controlled malls, covered gallerias, arcaded passages and open streets. Intersections in the system could be treated as focal points with landscaped sitting areas and small squares.

Continuous arcades should be provided along the open routes to protect pedestrians and to separate pedestrian-scaled activities from the vehicular traffic.

#### 4.50 Design Potential

To illustrate the potential urban character of the town centre, examples of appropriate prototypes developed elsewhere have been translated to the Townsend setting. (See Figure 4.50a.) These prototypes represent images and layouts that could be achieved in particular parts of the centre.

The focus of this urban structure is the central spine running through the middle of the commercial core. (See Figure 4.50b.) Public squares and spaces punctuate the spine at convenient intervals for the pedestrian, creating focuses for special developments and activities, such as a city hall or theatre.





1



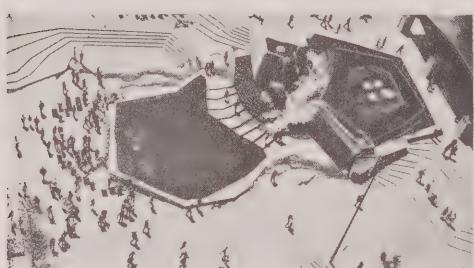
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2



6



3



7



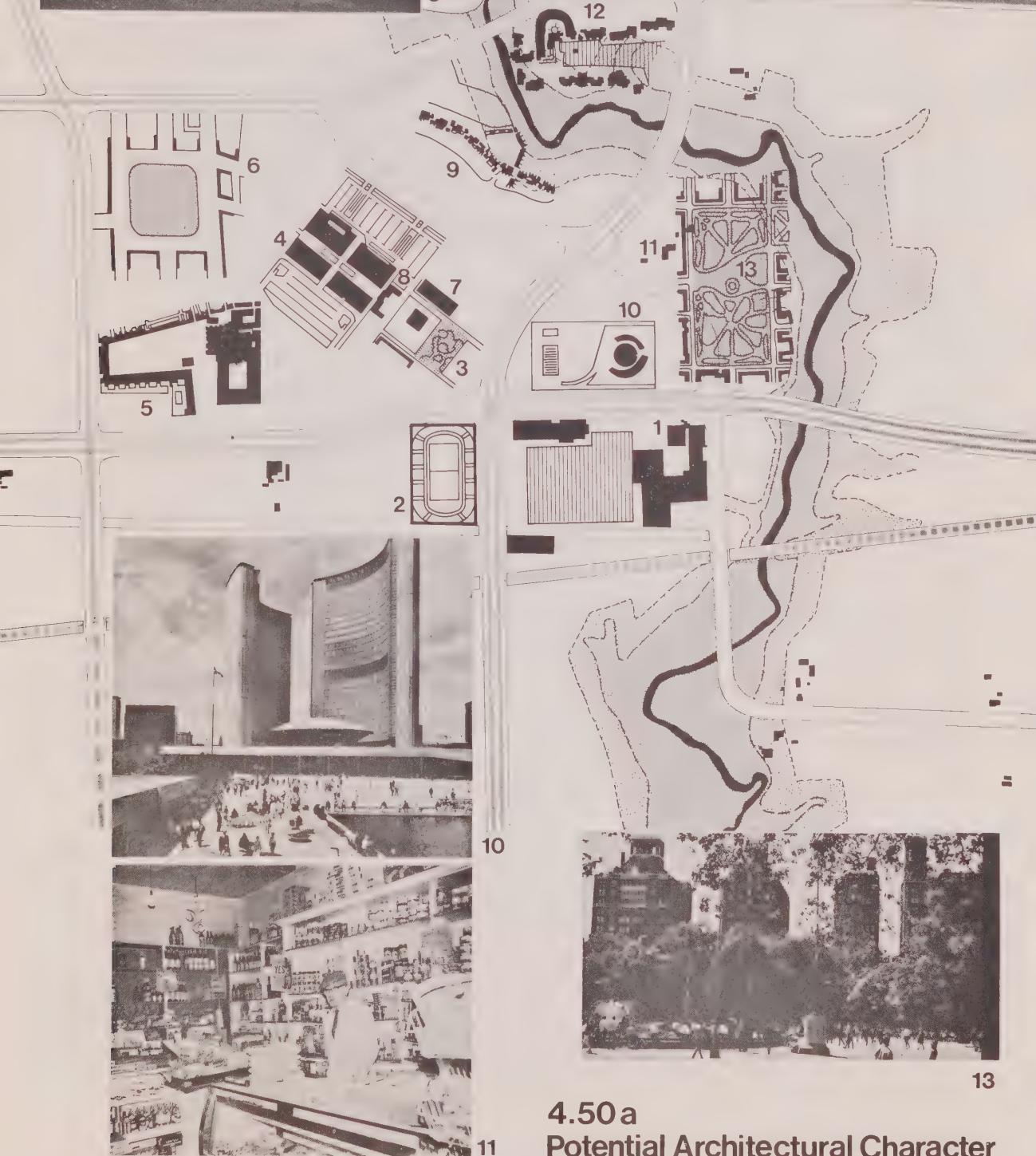
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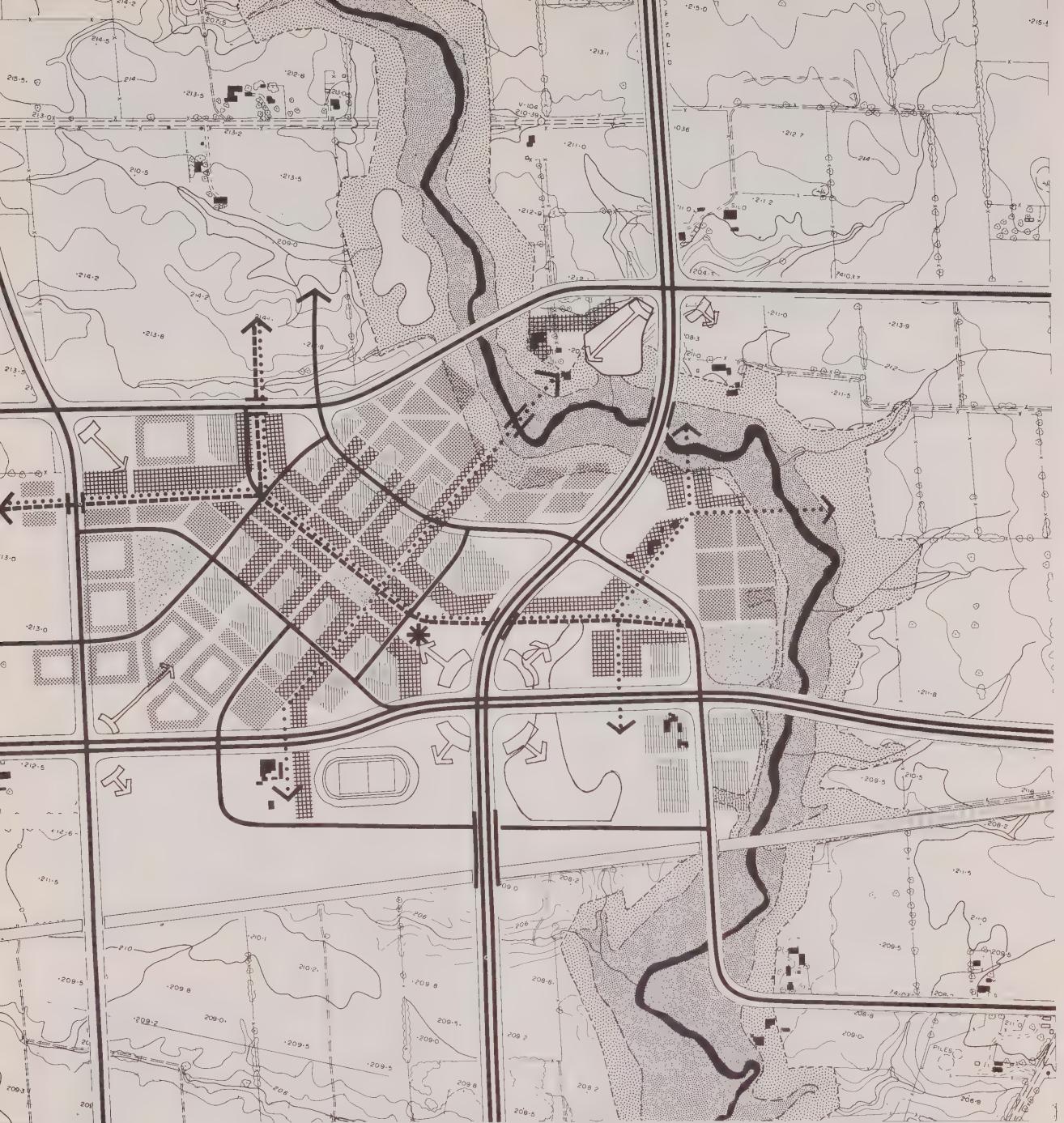
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12



4.50a  
Potential Architectural Character



## Design Potential

- Major Commercial and Community Facilities
- Main Parking Areas
- Housing Areas and Local Facilities
- Open Space

150 M  
500 FT

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COMMUNITY DEVELOPMENT PROGRAM



4.50c

Off the spine within the core, there are protected gallerias for pedestrians providing links to diverse parts of the town centre. The buildings wrap around the parking areas to minimize visual intrusion, and maintain pedestrian scale and continuity on the internal shopping streets.

Outside the core, the development is concentrated along a number of fingers emanating from the commercial spine. One of these links the core to the initial activity centre north of the Nanticoke. (See Figure 4.50c.)

Housing in the town centre can take a variety of forms: linear apartments along the walkways into the commercial core, terraces overlooking the Nanticoke, townhouses around urban squares, maisonettes over shops.

#### 4.60 Phasing Considerations

##### Development structure

The town centre has been laid out in a series of grid blocks, each defining an individual development parcel. Such a pattern allows for growth similar to the historic development process of streets and building plots.

This approach retains the advantages of integrated planning, like continuous street frontages and protected pedestrian routes. It also allows growth to take place over time in various sizes of development packages — large projects occupying several building blocks or small projects on only one block. Each package can be a complete and viable unit, but at the same time incrementally contribute to the overall infrastructure.

This approach also should encourage variety of investment and participation in the town centre. There is a great degree of choice of site layout at each stage of growth. Organizations and businesses locating in the centre are better able to achieve a sense of identity and independence, especially as particular buildings can be built on an almost domestic scale. Individual units of accommodation can allow for varying degrees of separate management and control within an overall development framework.

Comprehensive planning with block-by-block development guidelines will be necessary to ensure development on each block is integrated with the surrounding fabric. A detailed design brief should be prepared for each block, dealing with the uses and their relationship to the supporting infrastructure and site features.

### Growth stages

At the 5,000 population level, a local activity centre is planned directly north of the town centre, incorporating the marketing facilities and development offices. (See Section 6.32.) Although it will serve in the early years primarily a neighbourhood function, given its attractive site and good access, the centre has the potential in the long term of becoming a special extension of the town centre for specialty shopping or entertainment.

Activities in the town centre at this time probably will be limited — the initial stage of the regional administrative centre, a health care facility, a small hotel and perhaps the municipal offices. They will be clustered along the realigned Townline Road south of the Nanticoke with about 100 apartment units.

By the 20,000 population level, the area could be an identifiable multi-use centre. Townsend, together with the surrounding region, could support the initial stage of a department store, a major supermarket, drug-store and associated shopping, amounting in total to 23,000 m<sup>2</sup> (70,000 ft<sup>2</sup>) of shopping floorspace. Other development could include approximately 600 apartment units, an expanded regional administrative centre, other professional and government offices, a community health centre, indoor recreation centre, and various social and other services.

The shopping, together with the community facilities, could be developed in a climate-controlled mall, located to the west of Townline Road and served by at-grade parking areas.

The diagonal road paralleling the Nanticoke is shown developed by the 20,000 population level. This road is the first link in the distributor system for the town centre and also provides access to the housing areas to the northwest and along the valley.

A comprehensive pedestrian and bicycle system is planned by this time between various parts of the central area and the surrounding town. The regional administrative centre will be linked to the first activity centre and the community college by the existing Nanticoke bridge. A grade-separated crossing of Townline Road is planned to connect this system to the shopping complex.

By the time Townsend reaches 30-40,000 population, the town centre should have the character of an intensive, lively and diversified downtown. With the provision of a full department store by this time, the development of the first multi-level commercial space could occur with considerable expansion of other specialist shops and facilities.

In general, the development for the town centre is planned to proceed from the northeast corner to the southwest. Therefore, the centre throughout its life will be developed in a compact and continuous form directly adjacent to the associated housing area. At the same time, it can have expansion space to accommodate additional uses. Whenever it becomes apparent that this space is not needed for further downtown uses — or if Townsend's development was curtailed — the remaining area to the southwest could be developed for housing.



## 5.00      INTERMEDIATE PLAN (20,000 Population)

The plan for the community at the 20,000 population level has been prepared to provide a planning context for the first stage of 5,000. It indicates a possible next stage of growth, and therefore, how the roads, schools and other features of this more detailed plan might relate to the surrounding area.

### 5.10      Development Areas

The 20,000 population threshold, using current population projections, roughly represents a ten-year time horizon. Development over this period will be affected by many factors that cannot be foreseen. Two of the many possible development options have been examined and illustrated, and a preferred one selected because it best reflects current development preferences. This plan should be treated only as a broad indication of what might be finally developed.

The community at the 20,000 population level can be developed in two fundamentally different locations: either straddling the Nanticoke Creek or entirely to one side. With the recommendation to locate the first stage east of the Nanticoke, the possibility of developing between the Black Creek and Nanticoke Creek — as reviewed in the Phase II report — has been removed. However, this option has been replaced by the possibility of developing eastwards to the Sandusky.

### 5.11      Eastern Option: Development between the Nanticoke and Sandusky Creeks

The eastern option has the apparent advantage of developing in a compact and well-defined area. (See Figure 5.11.) It utilizes mainly existing roadways for the arterials and no bridge crossings will be required except at Townline Road. Therefore, the arterial road system can be established early, and gaps need not be left in the urban fabric for subsequent roadway construction.

The road network for regional movement would be well-balanced with Townline Road to the west and regional road 55 to the east. However, the initial traffic modelling indicates that the Nanticoke bridge crossing for Townline Road may require six lanes because it is the sole link to the town centre for the community.

The servicing costs of the two options have not been determined; these will depend on the detailed design of the systems. The overall servicing costs, which will depend primarily on the storm water and sanitary drainage systems, might favour the eastern option. The housing development along the Nanticoke will require a storm water retention pond for each side; whereas development to the east can be served by one pond at Nanticoke, but with some additional storage in the Sandusk valley. Development along the Nanticoke also may require a longer sanitary sub-trunk.

Against these possible advantages must be weighted the disadvantages concerning the character of the site and its relation to the town centre.

The area towards the Sandusk is virtually flat and featureless. It also has heavy clay soils and poor surface drainage. All of these factors make it a generally less attractive area to develop.

Despite the compactness of the development area, the residential areas and the town centre are not physically well-related. The housing virtually is entirely to the east of the Nanticoke, and the main facilities to the west. While this pattern leaves great flexibility for the town centre, it does not incorporate the centre as an integral and vital component of the community. Furthermore, the centre would remain a largely peripheral feature in the town if Townsend does not grow as expected.

### 5.12 Western Option: development along the Nanticoke Creek

In comparison with the eastern option, development along the Nanticoke does not present — at least in plan form — a cohesive image. (See Figure 5.12.) The urban area straddles the Nanticoke valley. The western edge of the community is not well-defined by physical features. Rights-of-way for some of the arterials and bridge crossings must be left undeveloped. However, these features may be less apparent on the ground than from a plan, as the developed area itself is compact, and the Nanticoke valley is likely to be a unifying feature visually.

The sense of indeterminacy of the plan, in any case, reflects that it is only a temporary staging point towards a larger community. It offers a variety of sites that can respond to different possible paces and

## Development Area: 20000 Population Alternative Area

- [Solid grey square] Housing Area
- [Diagonal hatching square] Commercial and Social Facilities
- [Solid black square] Open Space
- [Cross-hatching square] Industrial Area
- [Solid black rectangle] Arterial Roads
- [Solid black rectangle] Collector Roads
- [Dotted line] Pedestrian Path
- [Pond symbol] Pond

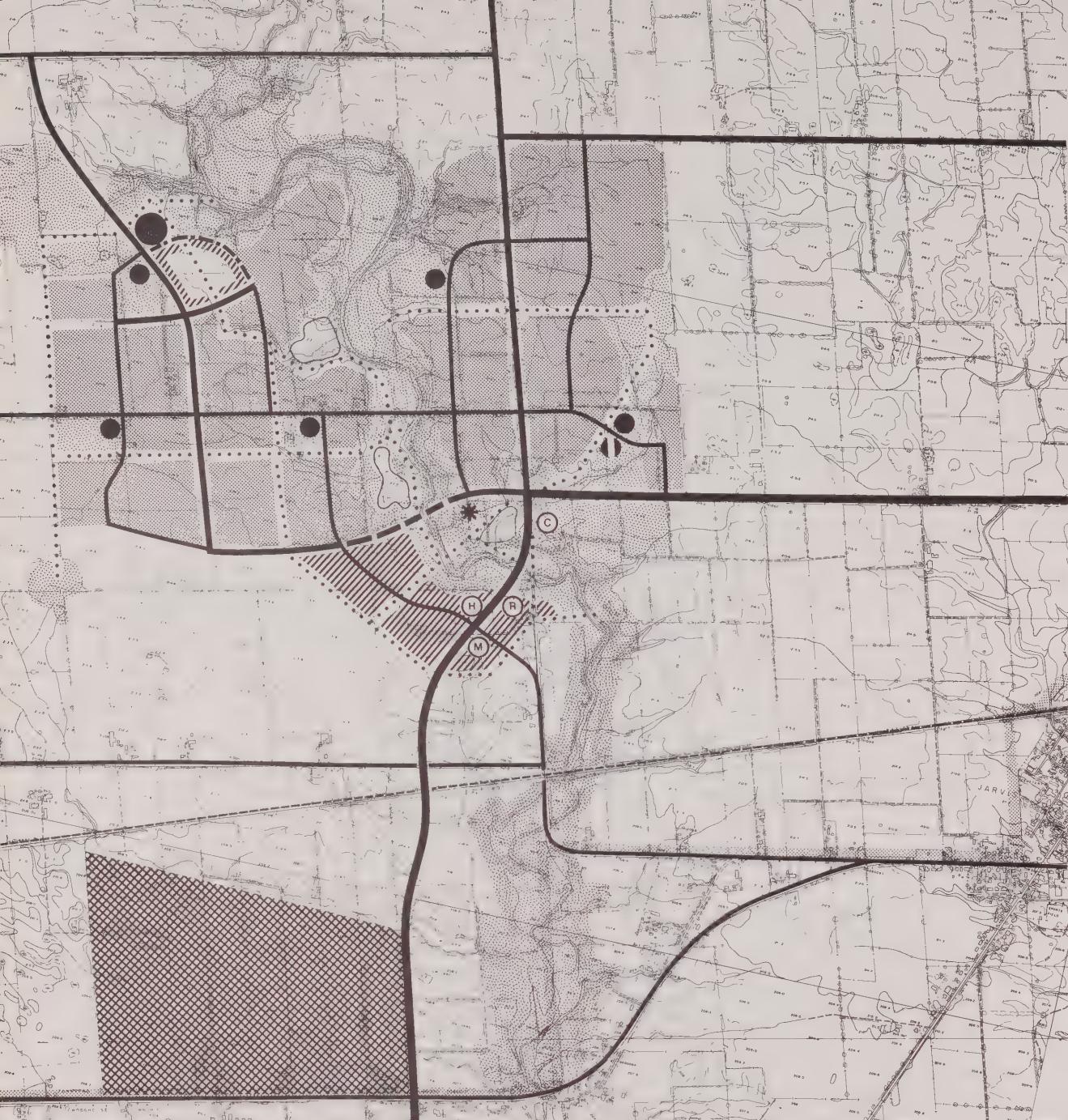
- [Star symbol] Initial Activity Centre
- [Solid black circle] Public High School
- [Solid black circle] Public Elementary School
- [Open circle with border] Separate Elementary School
- [Open circle with border] Community College
- [Open circle with border] Regional Administrative Centre
- [Open circle with border] Hotel
- [Open circle with border] Health Facility

300M  
1000 FT

Date Apr. 77

**TOWNSEND**  
COMMUNITY DEVELOPMENT PROGRAM





## Development Area: 20000 Population Preferred Area

- Housing Area
- Commercial and Social Facilities
- Open Space
- Industrial Area
- Arterial Roads
- Collector Roads
- Pedestrian Path
- Pond

- \* Initial Activity Centre
- Public High School
- Public Elementary School
- Separate Elementary School
- C Community College
- R Regional Administrative Centre
- H Hotel
- M Health Facility

300M  
1000 FT

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# TOWNSEND

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types of development. For example, sites are available near the Nanticoke, on the tableland or next to the town centre, for accommodating a wide spectrum of housing types.

If Townsend's development was curtailed, the plan also can adapt. By concentrating housing development around the centre, a compact urban area can be created focusing on the town centre.

In summary, development solely to the east might have lower infrastructure costs than the alternative. However, development along the Nanticoke has the merit of focusing development on the town centre, developing in a more attractive — and presumably more marketable — area of the site, and providing flexibility to respond to different growth conditions.

## 5.20 Recommended Plan

The development area is defined on the east by a major woodlot and associated hedgerows, and on the west by the outer limit of the drainage area for the Nanticoke sewer system.

The total land required for development at the 20,000 population level is about 350 ha (875 a). Of this, housing and the associated residential uses account for approximately 250 ha (625 a). The town centre at this time might cover about 20 ha (50 a). The land budget does not incorporate the public parkland that might be provided outside the developable area within the Nanticoke valley. (See Table 5.20a.)

## 5.21 Housing Areas

The low and medium density housing areas are located on both sides of the Nanticoke valley. The higher density housing predominantly for single people and small families is concentrated in or near the town centre along the Nanticoke valley.

Additional housing areas, shown striped, indicate possible next or alternative areas of development depending upon the growth of the town centre and the demand for housing around it.

The land allocated to housing is based upon relatively modest lots and local roadways, as incorporated in the detailed plan for the 5,000 population level. (See Section 6.31.) The resulting net residential densities are about 27 dw/ha (11 dw/a). (See Table 5.20b.)

Table 5.20a: Land Budget for 20,000 Population

Land-Use	ha	a
<b>Residential Area</b>		
Net housing area:		
low density (1,685 dwellings)	96	237
medium density (2,827 dwellings)	94	232
high density (908 dwellings)	12	30
Elementary schools (K to 8):		
5 public	16	40
2 separate	6½	16
Local parks	12	30
Playgrounds	8	20
Pedestrian system	8	20
Local shops and community facilities	½	1
	<u>253</u>	<u>626</u>
<b>Initial Centre (exclusive of housing)</b>	1	2½
<b>Secondary Centres</b>		
Community park	10	25
Community facilities and churches	1½	4
Secondary school	5½	14
	<u>17</u>	<u>43</u>
<b>Town Centre</b>		
Commercial facilities:		
department store, supermarket and associated shops	8-12	20-30
Office space:		
regional administrative centre	2	5
Nanticoke municipal offices	1	2½
miscellaneous federal and private offices	½	1
Community facilities:		
health care centre	½	1
churches (3)	2	5
other	1	2½
Educational facilities:		
community college (with secondary school)	7	17
Recreation facilities	2	5
	<u>24-28</u>	<u>59-69</u>
<b>Employment and Utility Areas</b>		
Public works depot	8	20
Retention ponds	13	32
	<u>21</u>	<u>52</u>
<b>Circulation Infrastructure</b>		
Town-wide pedestrian and bicycle routes	6	15
Arterial roads	26	64
	<u>32</u>	<u>79</u>
<b>TOTAL (approximately)</b>	350	870

At this time, the children in the public elementary school system are expected to number approximately 2,800, which would require approximately four full 600-pupil schools and the first stage of another. The 1,200 separate school children will require two full schools.

The public elementary schools have been distributed so that maximum walking distances to public schools will be generally within 500 m (1,650 ft). One of the two separate schools has been located on either side of the Nanticoke valley. To provide safe and convenient access, these schools have been located near the intersection of major pedestrian routes and the residential collector roads, which will be used by the local bus services.

Reserved sites for possible local centres also have been indicated. These could typically contain a corner store and perhaps one or two more retail outlets.

Table 5.20b: Housing Land for 20,000 Population

Density Range	Net Density		Mix (%)	Dwellings	Area	
	dw/ha	dw/a			ha	a
Low	17½	7	31	1,685	96	237
Medium	30	12	52	2,827	94	232
High	75	30	17	908	12	30
Total/Average	27	11	100	5,420	202	499

## 5.22 Major Facilities

The main commercial and community facilities have been concentrated in the town centre off the diagonal distributor to the east of Townline Road. The town at 20,000 could support a large supermarket plus convenience shopping and personal services, all amounting to about 15-16,000 m<sup>2</sup> (160-175,000 ft<sup>2</sup>) of floorspace. With the additional support population from the wider region, the first stage of a department store also might be viable. The department store, with the associated comparison and specialty shopping, could lead to a total of 21-23,000 m<sup>2</sup> (230-250,000 ft<sup>2</sup>) of shopping space. Adding the car parking required, the site area for commercial facilities could range from 7 to 12 ha (20 to 30 a).

The sites shown for both the community college and the regional administrative centre allow for a second stage of development. By this time the community college could grow to about 27,500 m<sup>2</sup> (300,000 ft<sup>2</sup>) and the regional administrative centre to a total of 4,500 m<sup>2</sup> (50,000 ft<sup>2</sup>).

Other facilities in the town centre could include an indoor recreation facility, a health care facility, various churches and additional private and public office space.

The community at the 20,000 population level could contain about 1,650 high school students. This number will warrant building only one 1,200-pupil school. The excess normally would be bused to high schools in other communities, or accommodated in portables. Instead of these two alternatives, consideration should be given to locating a high school on the community college site. This could use separate or rented teaching space, but share the playing fields and other major facilities like auditoria.

Because of the large number of students needed to justify a high school, the problem of undercapacity will occur many times through the growth of the town. Joint use of the community college facilities could provide a means of flexibly accommodating these students, as well as more intensively using the large community college site in the early years. In the long term, the college could take over accommodation permanently, or a special high school could be established for technical training.

The first full high school could be located either in the first secondary centre or with the community college. The decision will depend upon the rate of growth at the time, and the arrangements for sharing that could be made with the community college.

The secondary centre at the 20,000 level could contain the second separate school, the first stage of a supermarket and some associated shops, and perhaps a church campus.

Any industrial development at this time can be accommodated in the area to the south of the town along highway 3.

### 5.23 Circulation Framework

The first strands of the arterial road system should be established by this time. The collector road system within the housing area can probably handle the anticipated traffic. Nevertheless, developing the arterials will add clarity to the overall town structure and would remove extraneous traffic from the housing area, especially undesirable construction traffic.

The construction of the new bridge crossing north of the town centre will depend upon the degree of central area activity. The bridge will provide another means of access to the centre, thereby relieving Townline Road of some traffic and turning movements. Furthermore, it will allow residential traffic from the west to bypass the centre, relieving the town centre distributor road of some through traffic.

The internal bus service at this time probably will follow two loops linked at the town centre. The buses can loop on the residential collector through the housing areas on one side of the Nanticoke, stop at the centre, and then run through the housing on the other side. The service will also serve any facilities located in the secondary centre.

Any industrial service to the Nanticoke area will depend upon demand. It can use the town centre as a collector point, or loop through the housing area. Regional services will stop at the centre, gaining access along Townline Road from highway 3 and along the east-west arterial from highway 6.

#### 5.24 Engineering Services

The entire development area will be served by the Nanticoke sanitary sub-trunk and its associated collector system. The sub-trunk will directly link to the regional sanitary system.

Three retention facilities for storm water will be required along the Nanticoke; two for the housing areas on each side of the valley and the third for the town centre. The industrial area will require separate provision.

Water supply probably will come directly from the regional purification plant, with the water tower providing limited on-site storage to overcome any temporary stoppage.



## 6.00 DETAILED PLAN (5,000 Population)

A detailed plan has been prepared for the first stage of residential development. Incorporated is housing for 5,000 people, together with their necessary local facilities and the initial components of the future town centre. (See plan inside back cover.)

### 6.10 Site Description

The housing area for the first 5,000 persons straddles the existing Townline Road directly to the east of Nanticoke Creek and north of the proposed town centre. (See Figure 6.10.) The development area is a particularly attractive part of the site, as it rests on relatively rolling land between the Nanticoke valley to the west and a prominent woodlot on its eastern limit. The initial local facilities for the housing and marketing centre are located on a dramatic site overlooking the Nanticoke, and can be readily seen from the two main access roads.

### 6.11 Initial Infrastructure

The early housing will be served from Townline Road, providing a direct link to highway 3 and to the Nanticoke industrial area. Set within a landscaped corridor next to the Nanticoke valley, this road should be an attractive entry into the town.

The existing east-west concession road also will connect the area directly to regional road 55 and highway 6 to the east. This concession road will be an important early entry to the community, and a means of access to the industrial area.

The site is well-located for the planned regional services coming from the south — the sanitary sewer in the tableland between the Nanticoke and the Black Creeks, and the water main along either Townline Road or the sanitary sewer. The storm water from the area, which is contained entirely within one sub-watershed, can drain into the Nanticoke valley after suitable retention measures.

### 6.12 Development Options

The initial development for the 5,000 population will be contained within a compact area. The local roads and services can be efficiently laid out; and all the facilities needed at this time can be centrally located within short walking distances of all the houses. As a consequence, if the community did not grow beyond this size, it could be a relatively cohesive and well-structured settlement.

The initial local facilities with marketing centre can be concentrated directly across the Nanticoke valley from the future town centre. Coupled with the regional administrative centre, they should serve to create an early identity for the town centre, but without restricting the longer-term development options of this important area.

The area appears to be a logical first stage for the planned further development. Until approximately the 20-30,000 population threshold, the development can be contained within the attractive parts of the Nanticoke watershed and around the incipient town centre. If development were curtailed during this period, the community could be compact and cohesive with the addition of some housing in the town centre site.

### 6.13 Environmental Features

The development area is defined on the west by the flood and fill lines of the Nanticoke valley. A number of minor drainage courses run through the area to the valley, and should be retained where possible within the local pedestrian system for storm water drainage.

The initial development area contains a number of historic buildings. Three have been rated Grade 1 because of their architectural merit and/or historical significance, and should be retained as part of the new community.\* The most important of these is probably the "Anderson" residence, west of Townline Road and north of the Nanticoke, which is large enough to be used for a public facility. The remainder are rated as Grade 2; while they do not have outstanding architectural features, they do reflect Townsend's past and should be retained if possible.

Note also has been made of two other historic features: the cemetery on the Anderson farm and the iron and steel railway bridge over the Nanticoke.

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\* The Ministry of Culture and Recreation (Historical Planning and Research Branch; Heritage Conservation Division), "Townsend Traces — Heritage Conservation in Townsend New Town", September 1976.



## Site Conditions Initial Development Area

- Stream Courses
- Flood Plain †
- Fill Line †
- Historic Buildings: Grade 1\*  
Grade 2\*
- Initial Housing Area
- Cemetery
- New Arterial Rights-of-Way

- Woodlots: Quality - High  
- Medium  
Survivability - High  
- Medium  
- Low
- Hedgerows: Quality - High  
- Medium  
- Low



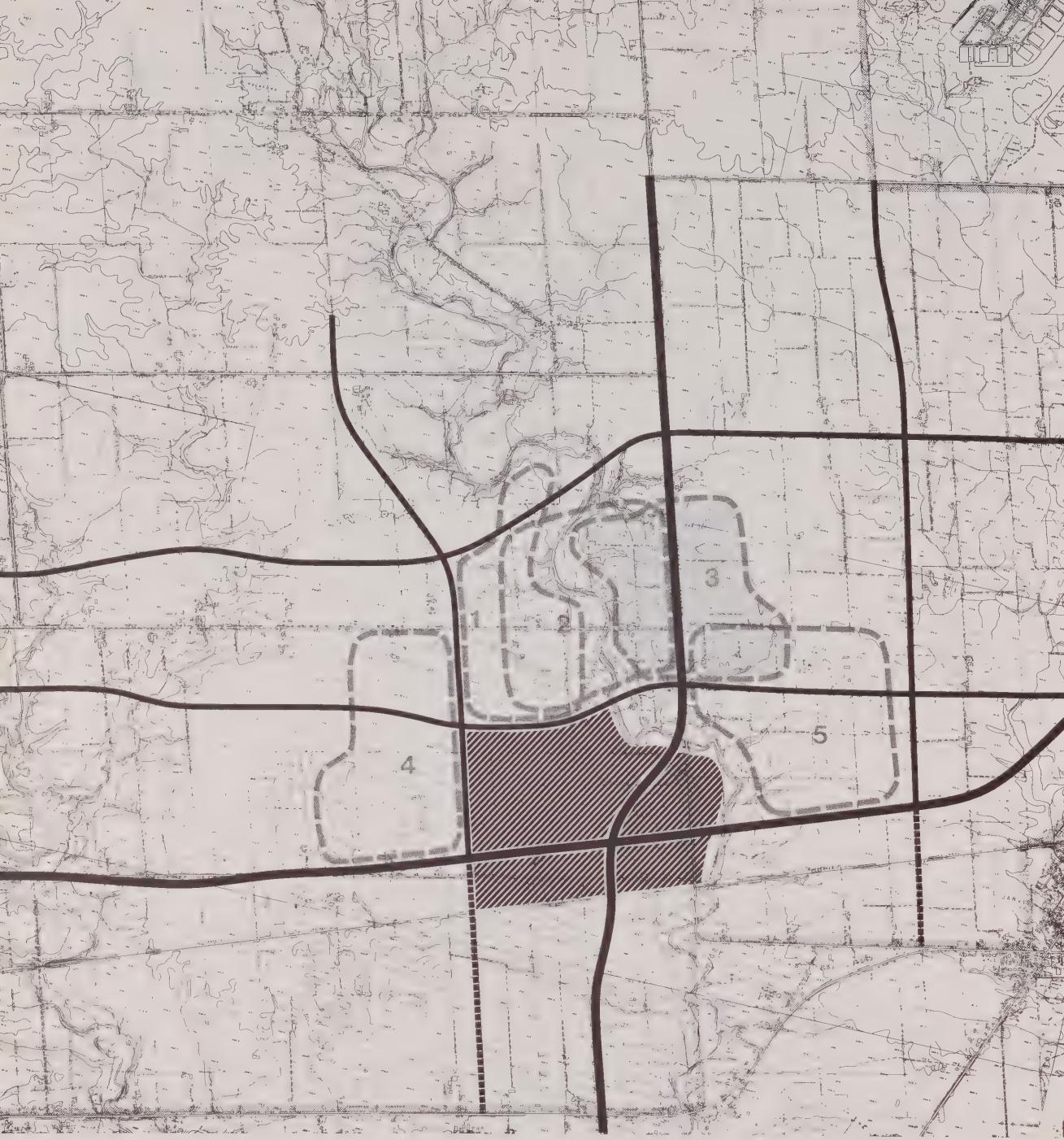
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# TOWNSEND

COMMUNITY DEVELOPMENT PROGRAM

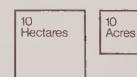


Source: \*MCR (Historical Planning and Research Branch) †LPCA



## Alternative Development Areas (5000) Pop. Infrastructure Cost Evaluation

- Alternative Areas
- Town Centre
- Recommended Site Area



500 M  
2000 FT



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The preliminary field survey\* of the town centre found archaeological material probably from the transient prehistoric native groups, but no archaeological site of significance. The survey will be continued in the spring to cover the first housing area. On the basis of this evidence, little of archaeological importance is likely to be disturbed by the planned construction in these areas.

All of the woodlots, hedgerows and trees in the initial development and the associated creek valleys have been evaluated for their bio-aesthetic quality and their survival potential in urban conditions. The major woodlot on the eastern edge of the area has been rated as medium quality, with varying survival characteristics, but these will not be affected by urban development.

Woodlots with low survivability under urban development conditions should be used only for passive recreation as part of the open space system. Woodlots with a medium survivability could be used for low density residential development or intensive recreation use, but careful planning and site control will be needed to protect vegetation and soil. The remaining woodlots could be used for multiple family housing, intensive recreation use, or institution use, but site controls will be needed to protect individual high quality trees.

A number of hedgerows and planted groupings of varying quality occur on the tableland primarily between the Nanticoke valley and Townline Road. In general, these should be carefully integrated into the urban fabric. If left undisturbed, they usually have a high tolerance of urban conditions.

All of the individual trees in the first housing area also have been evaluated. In general, high quality trees should be preserved and integrated into the development to provide a natural amenity for the housing area.

## 6.20 Site Selection

Midway through Phase II, the recommendation was made to locate the first development area to the west of the Nanticoke. At the same time, sites for the town centre and the regional administrative centre were selected. The location of the housing area now has been reconsidered, but the other sites remain unchanged.

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\* Archaeological Research Associates: "The Archaeological Survey of the Proposed First Neighbourhood of the Townsend Community Area", June 1976.

These recommendations were made after evaluating three alternatives. Prime consideration was given to developing the first housing area near the initial regional facilities on one side of the Nanticoke, in order to (1) minimize early front-end servicing costs and (2) create an early sense of community. When subsequently examined in detail, however, the first housing could not be closely associated with the initial facilities (which cover approximately 2 to 4 ha at the 5,000 population level) while leaving sufficient space for the town centre to grow to its ultimate size (perhaps 100 ha at 100,000 population).

Since the time of the original recommendation, the location also has been influenced by three other planning decisions:

- 1) Sanitary drainage: At the time of the original recommendation, a dual sanitary sub-trunk system was considered likely along the Nanticoke. Developing on both sides of the valley, therefore, was prohibitively expensive because sub-trunks on both sides of the valley and their associated pumping stations had to be developed. However, after a more detailed examination of the engineering cost and environmental damage, laying a single sub-trunk somewhere in the valley is now considered preferable to laying one on both sides. This single sub-trunk also can be suitably aligned to serve both the housing area and early facilities in the town centre.
- 2) Community college: A site for the community college has been designated east of Townline Road directly north of the Nanticoke. The initial facilities for the college, which are presently timed for 1981, could represent the major facilities in the community at that time available for public use. Locating the housing near the college would provide two advantages: the other local facilities can be grouped near the college to create a more identifiable early centre, and the initial engineering services can be shared.
- 3) Townline Road: In the middle of Phase II, agreement had been reached in principle to complete the missing link in Townline Road between highway 3 and the railway, but the possible alignments ranged over a kilometre to the east and west of the Nanticoke. The alignment subsequently selected passes west of the Nanticoke valley before crossing over the Nanticoke near the existing bridge. This alignment will provide more direct access to the currently recommended location for the first housing than the previous area.

Finally, the initial infrastructure costs were also re-examined, in order to take account of the more detailed subsequent planning. Cost estimates were made for the major road and services for five alternative development areas, including the three originally examined. (See

Figure 6.20). Excluded from the comparison were the common services and roads: the regional trunk water main and elevated water tank, the improvements to Townline Road, and the sanitary pumping station and the forcemain to the sewage ponds.

Alternative 3, the area east of the Nanticoke as now recommended for initial development, required the least front-end infrastructure costs. (See Table 6.20.) This alternative was followed closely by alternatives 4 and 5. Areas 1 and 2 were found to be significantly more costly to prepare for development.

Table 6.20: Initial Infrastructure Costs (\$ mil 1976) for Alternative Development Areas (excluding common services and roads)

Infrastructure	Alternative Development Areas				
	1	2	3	4	5
Water Supply	0.4	0.4	0.4	0.4	0.3
Sanitary Drainage	1.3	1.4	0.7	0.8	1.0
Storm Water Drainage	2.8	3.9	2.0	2.2	2.4
Road System	0.1	0.4	0.3	0.2	0.1
TOTAL	4.6	6.1	3.4	3.6	3.8

### 6.30 Recommended Plan

The total land required for urban development at the 5,000 population level could amount to about 95 ha (236 a). (See Table 6.30a.) Of this, about 70 ha (175 a) is needed for housing and associated facilities, and the remainder primarily for transportation and utility areas. The area excludes the natural parkland within the Nanticoke valley that will be available for public use.

### 6.31 Housing Area

The housing area for the initial 5,000 residents has been developed primarily in a compact neighbourhood centred on Townline Road, where it will have ready access to the Nanticoke valley in the west and the first local centre to the south. The few apartment units needed at this time have been located in the first local centre and south of the Nanticoke in the town centre.

Residential land is the largest component of the budget. The area projections presently are based upon a 20 m (66 ft) right-of-way for collector roads and 17 m (56 ft)

for local roads, and relatively modest lots. For example, the low density range typically could accommodate single detached houses on 12-15 x 30 m (40-50 x 100 ft) lots, and semi-detached or link houses on 9-10½ x 30 m (30-35 x 100 ft) lots. The medium density typically could be composed of street townhouses or row-houses on 6½-9 x 30 m (22-30 x 100 ft) lots. The upper density housing, which is a small part of the total requirement, could be accommodated in three to four storey apartments or stacked maisonettes.

Table 6.30a: Land Budget for 5,000 Population

Land-Use	ha	a
<u>Residential Area</u>		
Net housing area:		
low density (408 dwellings)	23	58
medium density (887 dwellings)	30	74
high density (113 dwellings)	1½	4
Elementary schools (K to 8):		
public (600 pupil places)	3	7½
separate (340 pupil places)	3	7½
Local parks	3	7½
Playgrounds	2	5
Pedestrian system	2	5
	<u>67½</u>	<u>168½</u>
<u>Initial Centre (exclusive of housing)</u>	1	2½
<u>Special Facilities</u>		
Regional administrative centre	1	2½
Community college (with secondary school facilities)	3	7½
	<u>4</u>	<u>10</u>
<u>Employment and Utility Areas</u>		
Public works depot	8	20
Retention ponds	4	10
	<u>12</u>	<u>30</u>
<u>Circulation Infrastructure</u>		
Town-wide pedestrian and bicycle routes	2	5
Arterial roads	8	20
	<u>10</u>	<u>25</u>
<u>TOTAL</u>	95	236

On this basis, the overall net residential density inclusive of housing and residential roads is about 26 dw/ha (10½ dw/a). (See Table 6.30b.) The neighbourhood density, when schools and other local facilities are included, is about 20 dw/ha (8 dw/a).

Table 6.30b: Housing Land for 5,000 Population

Density Range	Net Density		Mix (%)	Dwellings	Area	
	dw/ha	dw/a			ha	a
Low	17½	7	39	408	23	58
Medium	30	12	53	887	30	74
High	75	30	8	113	1½	4
Total/Average	26	10½	100	1,408	54½	136

Two elementary K to 8 schools will be required at the time. One will be a 600-pupil public school for the approximately 770 public school children living in Townsend. The surplus must be either accommodated in portables or bused to schools outside the site. The other will be a separate school for approximately 340 children. This starter school will be eventually expanded to 600 places, and therefore, has been allocated a full site.

The schools have been located within the housing area, northeast of the local centre, where they will eventually form part of a diagonal open space corridor across the grid square and leading to a later secondary centre.

A second public school site also has been indicated because another starter school will be needed when the population reaches slightly less than 6,000 persons.

### 6.32 Local Centre

The local facilities serving the day-to-day needs of the early residents have been concentrated in an initial centre together with the marketing centre. (See Figure 6.32.)

The centre is on a site of 2 ha (5 a) overlooking the Nanticoke and near the intersection of the two main access roads. In total the centre can accommodate approximately 2,800 m<sup>2</sup> (30,000 ft<sup>2</sup>) of commercial and associated facilities, together with the associated parking and service areas, and approximately 40 apartment units. (See Table 6.32.)

The facilities tentatively earmarked for this site include the following:

- a general store for groceries, drugs and miscellaneous other goods, and temporary post office services.

- shops for a dry cleaner, barbershop/hairdresser, restaurant and an LCBO/Brewers Retail outlet.
- offices for a doctor, dentist, and perhaps, a lawyer and real estate agent.
- a marketing centre that could be used also as a public meeting place.
- a site office for the development agency.

Some of these facilities can be contained in the historic "Anderson" farm residence and the associated barn on the site. The site also will contain the first retention pond that will be used as a visual and recreation amenity.

Table 6.32: Land Budget for the First Activity Centre

Components	ha
1. Housing development: 40 apartment units with parking	0.5
2. Commercial and community facilities: general store personal services and bank restaurant liquor/beer/wine outlet professional offices Townsend project offices marketing centre and meeting hall	0.2 700 m <sup>2</sup> 650 200 75 150 500 500
3. Public plaza and open space	0.3
4. Car parking: 150 spaces approximately	0.5
<b>TOTAL</b>	<b>1.5</b>

### 6.33 Circulation System

Townline Road and the east-west concession road to the east will be the main access roads into the early development area of Townsend. Discussions to date indicate that the Regional Municipality could construct the new section of Townline Road and upgrade the concession road under the regional road program prior to first development, and take these lengths under their jurisdiction as regional road 69.

Completing the new section of Townline Road is important as access to the site from highway 3 is



**6.32 First Activity Centre and  
Retention Pond**



50 M  
1200 FT

Date Apr. 77  
Scale 1:2000

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**6.34 Quarry Pond and Landscaping**

50 M  
1200 FT

Date Apr. 77  
Scale 1:2000



**TOWNSEND**  
COMMUNITY DEVELOPMENT PROGRAM

limited. The recommended preliminary alignment passes to the west of the Nanticoke and over the CN railway. Although not warranted by the expected car and railway traffic at this time, a grade-separated crossing is proposed to increase safety, overcome later disruption to traffic, and improve the marketing image of the town. Whether an overpass or underpass should be built must be examined further, but an overpass is presently preferred for ease of construction and maintenance. A new bridge will also be needed over the Nanticoke further to the north. The road will be built with four lanes, but with an allowance for two further lanes if needed.

The residential collectors have been structured off the two regional roads. The collectors provide an independent and collector road system through the entire housing area. The roads east of Townline Road will form part of the collector system planned for the associated grid square when entirely developed. The roads to the west tie into the existing creek crossing. (See Section 3.14.)

A system of separate pedestrian walkways has been planned. Two routes follow drainage courses through the housing areas to the initial activity centre. The one to the west of Townline Road has been set within a series of linked open spaces, incorporating the existing woodlot, two school sites and the dry storage basins for storm water run-off.

A third walkway runs east-west across the housing area linking the woodlot in the east and the Nanticoke Creek and a future school site in the west. These will use underpasses to cross the new roads developed in the area. A pedestrian overpass also could be built for this route when Townline Road is improved along this length.

This pedestrian system is linked across the Nanticoke on the existing bridge to the regional administrative centre. Traffic will be taken off this bridge when the new crossing is made.

#### 6.34 Open Space

The first retention pond for the storm water system is adjacent to the local centre. The pond will have a water area of approximately  $2\frac{1}{2}$  ha (6 a). (See Section 3.43.) The pond has been designed as a visual amenity, with some limited recreation uses like skating in the winter and boating in the summer.

The Nanticoke valley is planned as a linear town park, to be used primarily for non-intensive recreation like hiking, cross-country skiing and picnicking. Early landscaping works should be undertaken to open the valley to the public.

The reclaimed landscaped quarry site will be a major feature within the valley. The pond planned in this area will be suitable for boating, fishing and skating. The slopes of the surrounding area can be used for tobogganning. (See Figure 6.34.)

The local parks next to the elementary schools should accommodate the more intensive recreation activities like tennis, baseball, football and soccer.

### 6.35 Major Facilities

The site selected for the new regional administrative centre covers about 1.7 ha (4.2 a) in the bend of the Nanticoke Creek east of the existing Townline Road. As a first estimate, it could accommodate the entire anticipated office space of 6,500 m<sup>2</sup> (70,000 ft<sup>2</sup>), but additional site area may be needed for greater design flexibility and additional facilities. Therefore, the possibility of extending the site westwards to the realigned Townline Road has also been indicated.

At the 5,000 population level, completion of only the first phase of 2,800 m<sup>2</sup> (30,000 ft<sup>2</sup>) could be reasonably expected. If the first building could be built adjacent to the realigned Townline Road, it would reinforce the identity of the initial development.

In the plan, a site of 11 ha (28 a) north of the Nanticoke and east of Townline Road has been provisionally allocated to the community college. This area is needed for their long-term needs.

Completion of the first stage of the college is expected by the 5,000 population level. It could include some 18,500 m<sup>2</sup> (200,000 ft<sup>2</sup>) of floorspace, which is sufficient for five years growth, and about one half of the currently projected accommodation for 2001.

The possibility of using this space and the associated playing fields for a temporary high school should be considered. At the 5,000 population level, there could be 375 high school students. Because this number does not justify constructing a high school, they must be bused to high schools outside the community unless alternative provision could be found.

Other facilities in the town centre at this time also could include a hotel and health facility.

A site also may be required in the town for a public works yard. Because of the size and potential visual character of this facility, it should be located in the industrial area along highway 3, rather than next to the regional administrative centre.

### 6.36 Engineering Services

The new regional sanitary drainage system can be available in Townsend for the first housing now scheduled for late 1980-early 1981. In this case, the interim sewage stabilization ponds as previously planned will not be required on the site.

The initial development area will be served by the Nanticoke permanent sub-trunk sewer leading to a pumping station located near the CN track on highway 3, and then linked by a forcemain along existing or proposed roads to the new central trunk sewer. (See Section 3.41.)

The new regional water supply system to Townsend is also expected to be operational prior to the initial development. (See Section 3.42.)

The trunk water main to the southern edge of Townsend from the Stelco industrial park most likely will follow the alignment either of the central trunk sewer or Townline Road. Northwards from highway 3 the main probably will run west of the Nanticoke valley along new or proposed rights-of-way to an elevated tank. This 45 m (150 ft) high elevated water tank (500,000 gal) is required to provide pressure control and interim on-site storage. If possible, this tower should be located near the town centre in order to serve as a landmark for Townsend.

The first retention facilities will be developed prior to first development, in order to control the increased run-off from the developed area. These will include the 2½ ha (6 a) pond next to the initial centre, and a supplementary "dry" basin in the park area northeast of the Townline Road/east-west concession intersection. The underground piped and surface drainage system will direct run-off to these facilities. The run-off will be subsequently discharged into the Nanticoke after the storm passes. (See Section 3.43.)

Ontario Hydro presently plan to serve the initial development from the Jarvis Transformer Station with a 27,600 volt overhead service. The service will be taken into the site along Townline Road along the hydro corridor paralleling highway 3 about 1 km to the south.

The telephone service to the new community could be provided by the Bell Telephone Company from the Jarvis switching station.



## 7.00 SUBDIVISION PLAN

A draft plan of subdivision has been prepared for submission to the formal plan process of the relevant public agencies. The subdivision plan defines sites for 892 dwellings and for the other facilities expected in the early years of Townsend. A site for a comprehensively designed housing area with approximately 210 dwellings has been included within this subdivision plan; this site is described in separate detail under Section 8.00.

### 7.10 Site Description

The subdivision is situated around the intersection of Townline Road and the east-west road between Walpole concessions 8 and 9. The area is defined by the flood line of the Nanticoke on the southwest and the existing leasehold lines on the north and east.

The subdivision represents virtually half of the detailed plan for the first 5,000 people. The main environmental features of this area have already been reviewed. (See Section 6.13.) In addition to this material, a detailed survey of every free standing tree in the area has been completed. An archaeological survey of the area will commence in the spring.

### 7.20 Planning Standards

The planning standards used in the subdivision plan are taken from the recommendations presented in a recent Ministry of Housing report\*. (See Tables 7.20 a and 7.20b.)

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\* Ministry of Housing (Local Planning Policy Branch), "Urban Development Standards — A Demonstration of the Potential for Reducing Costs", 1976.

Table 7.20a: Residential Site Standards

**1. Lot Sizes (minimum)**

Single detached	12.2 x 30.5 m (40 x 100 ft)
Semi-detached	9.1 x 30.5 m (30 x 100 ft)
Link house	9.75x 30.5 m (32 x 100 ft)
Street townhouse	6.7 x 30.5 m (22 x 100 ft)

**2. Yard Setbacks (minimum)**

## Front yard:

- to habitable room	4.5 m (15 ft)
- to living room	6.0 m (20 ft)
- to garage or carport with sidewalk	6.0 m (20 ft)
- to garage or carport without sidewalk	6.0 m (20 ft)

## Rear yard:

- to living room principal window	10.5 m (35 ft)
- to habitable room other than living room principal window	10.5 m (35 ft)
- for lot backing onto arterial (with privacy screening)	20 m (65 ft)

## Side yards:\*

- for internal side yards	1.2 + 0.6 m (4 + 2 ft) for each storey or partial storey above the first storey
- for flankage yard on corner lot	4.5 m (15 ft)

**3. Lot Coverage (maximum)\*\***

Single detached	35%
Semi-detached	35%
Link house	35%
Street townhouse	40%

**4. Parking Spaces**

Off-street spaces/unit	2
On-street spaces for visitor parking/unit	$\frac{1}{2}$

\* No house should be closer than 6 m (20 ft) from lot corner to maintain minimum corner vision.

\*\* Assumed minimum building area is 1,000 ft<sup>2</sup>. The required minimum landscaped outdoor living area adjacent to dwellings is half gross finished floor area.

Table 7.20b: Residential Road Standards

	Residential Collector	Local Road	Minor Local Road***
<u>Capacity Characteristics</u>			
Traffic volumes (AADT)	3,500 approx.	0-1,500	0-1,000
Dwellings served	150-450	0-150	0-100
Design speeds	35 mph	30 mph	30 mph
Typical posted speeds - km/h (mph)	50-55 (30-35)	40 (25)	40 (25)
<u>Cross-Section Features</u>			
Rights-of-way	20 m (66 ft)	17 m (56 ft)	17 m (56 ft)
Pavement width*	10 m (32 ft)	8.5 m (28 ft)	8 m (26 ft)**
Traffic lanes	2 x 3.5 m (11 ft)	2 x 2.75 m (9 ft)	2 x 2.5 m (8 ft)
Parking lanes	1 x 2.5 m (8 ft)	1 x 2.5 m (8 ft)	1 x 2.5 m (8 ft)
Median	none	none	none
Boulevard width	2 x 5 m (2 x 17 ft)	5 + 3.5 m (16 + 12 ft)	5 + 2.5 m (16 + 8 ft)
Sidewalk: number	according to warrants	one side only	not required
width	1.5 m (5 ft)	1.5 m (5 ft)	1.5 m (5 ft)
<u>Geometric Features</u>			
Centre line radius (minimum)	90 m (300 ft)	85 m (275 ft)	85 m (275 ft)
Stopping sight distance (minimum)	75 m (240 ft)	60 m (200 ft)	60 m (200 ft)
Intersection radius (minimum)	9 m (30 ft)	7.5 m (25 ft)	7.5 m (25 ft)
Cul-de-sac radius:			
pavement	-	-	10 m (35 ft)
property line	-	-	15 m (50 ft)

\* All based on two traffic lanes and inclusive of 2 ft (0.5 m) for two curbs.

\*\* For cul-de-sacs less than 100 m (350 ft) and 40 dwellings long, use 7.5 m (24 ft) pavement.

\*\*\* Cul-de-sacs are limited to maximum length of 230 m (750 ft) excluding bulb, and P-loops to 850 m (2,800 ft) excluding entry leg; both require 3 m (10 ft) wide emergency access.

The standards are intended to apply to new housing developments in areas outside Metropolitan Toronto, and without comprehensive development procedures.

The road standards are generally tighter, and the lot sizes and setbacks are less, than those currently employed in the region. The new standards reflect the urban conditions expected in Townsend, and the need to reduce housing costs to the means of incoming residents.

### 7.30 Recommended Plan

The subdivision area covers in total 80.6 ha (199.1 a). (See Figure 7.30.)

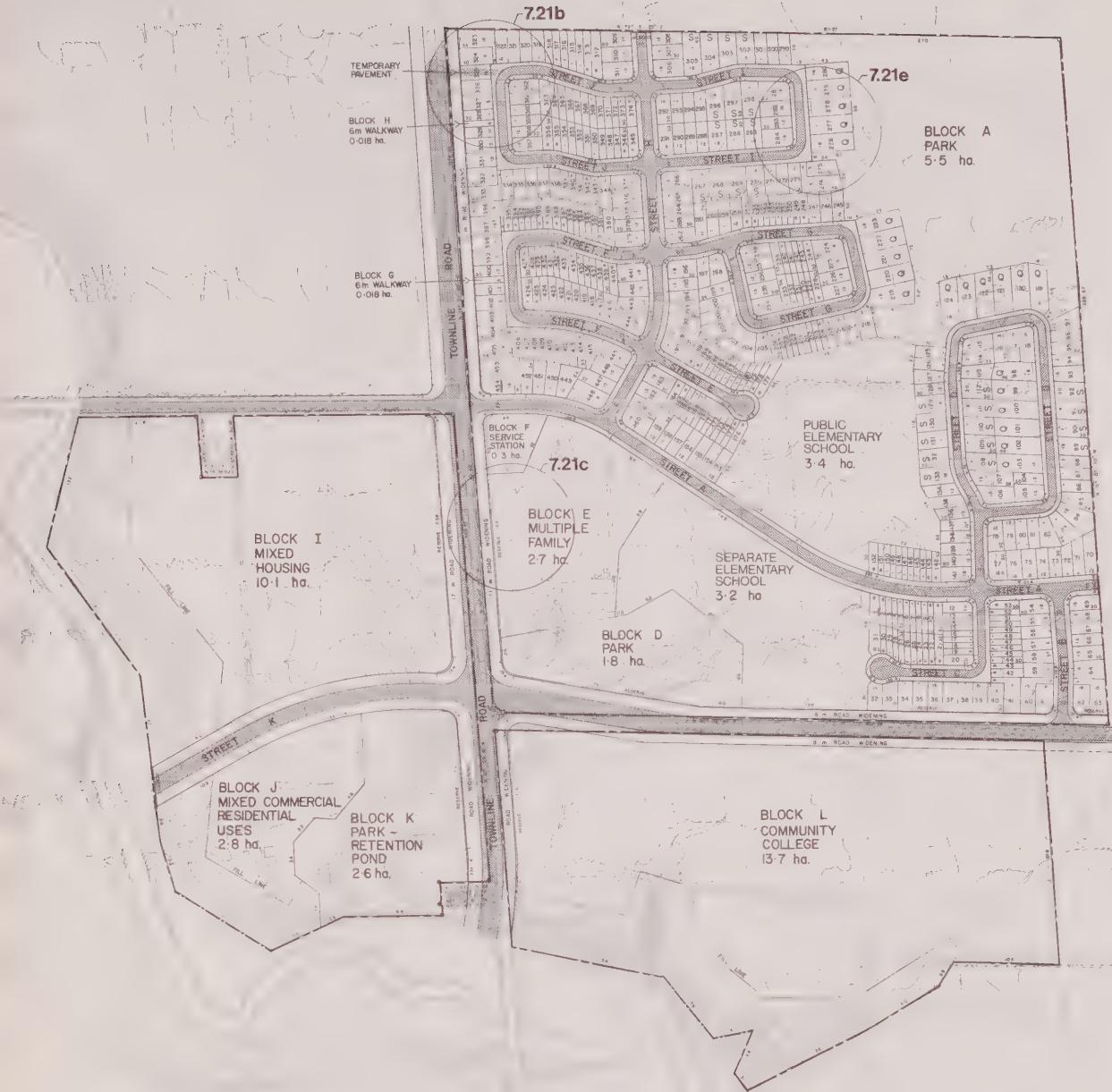
Of this,  $34\frac{1}{2}$  ha (85 a) has been lotted into housing sites for 548 units, exclusive of the multiple and apartment units and the mixed housing area. The net residential density, when local roads are included, is about 17 dw/ha (7 dw/a). The neighbourhood density, including local parks and facilities, is 12 dw/ha (5 dw/a).

### 7.31 Housing Types and Distribution

Lots have been laid out for a variety of sale units ranging from 15 x 30.5 m (50 x 100 ft) lots for single detached units to 6 x 30.5 m (20 x 100 ft) townhouses. (See Table 7.31.)

Table 7.31: Housing Schedule (Including Mixed Housing Area)

	Lot Size (m)	Number	%
<u>Sale Units</u>			
Single detached houses	15 x 30	70	8
	12 x 30	134	15
Semi-detached houses	9 x 30	56	6
Quadruplex	4½ x 15	88	10
Link houses	7½ x 30	58	6
Townhouses	6 x 30	142	16
		548	61
<u>Rental Units or Condominiums</u>			
Apartments (75 dw/ha)		40	4
Multiple housing (35 dw/ha)		95	11
		135	15
Total		683	76
<u>Mixed Housing Area</u>			
Single detached houses	9-11 x 23 m	45	5
Semi-detached houses	8 x 23 m	34	4
Link houses	6½ x 23 m	70	8
Multiple housing		60	7
		209	24
<b>TOTAL</b>		<b>892</b>	<b>100</b>



## Draft Plan of Subdivision

### Statistics

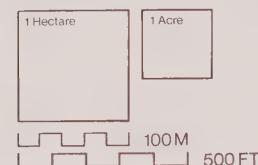
#### Parcel A

**Residential**  
Single Family, Townhouses  
Links, Quadruplex  
**Multiple Family**  
**Highway**  
**Commercial**  
**Schools**  
**Park**  
**Roads & Widening**

TOTAL

**Parcel C**  
Community College  
Widenings  
TOTAL 13.7  
0.7 14.4 ha.

		Type of Unit	N° of Lots	N° of Units	%
34.5	15m Single	70	70	8	
2.7	12m Single	134	134	15	
0.3	Zero lot line	45	45	5	
6.6	9 m Semi	45	90	10	
7.3	7.5m Link	128	128	14	
7.7	6 m Townhouse	142	142	16	
42.2 ha.	Quadruplex	22	88	10	
		sub-total	586	697	78
		Multiple Family	—	155	17
		17.8 ha. Apartments	—	40	5
		Total	586	892	100



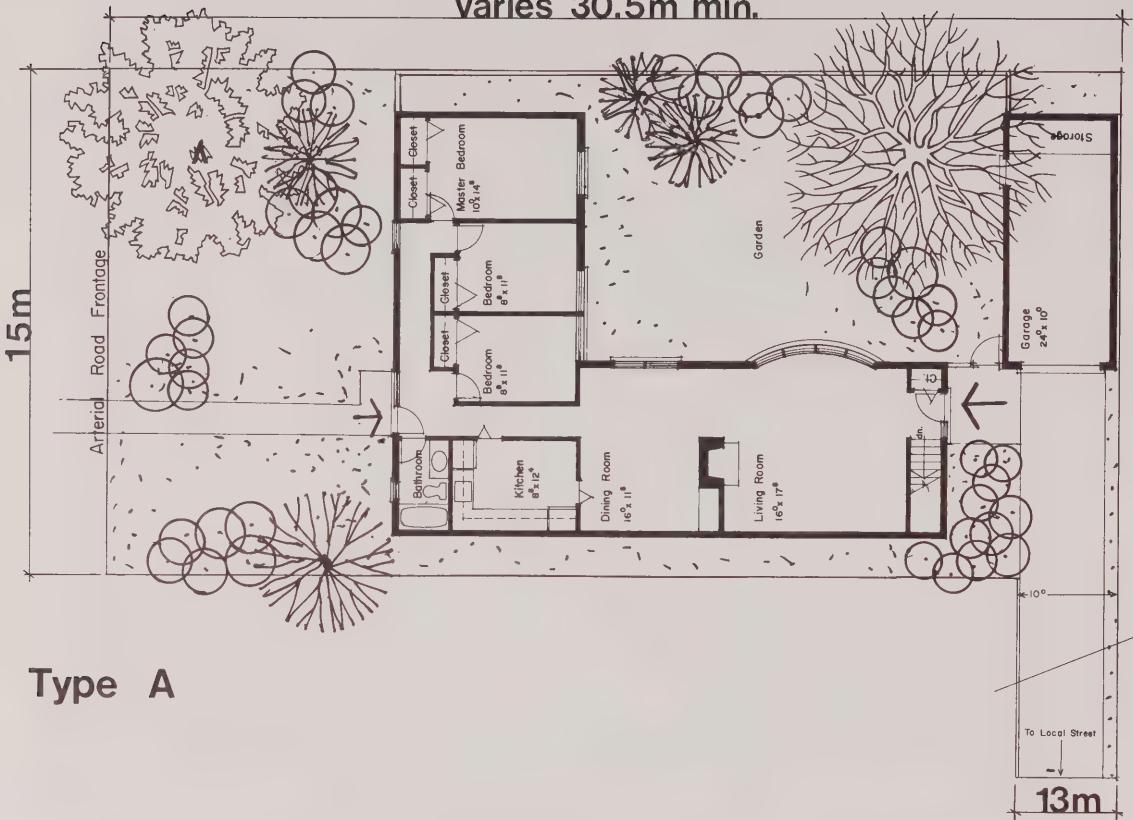
Date Apr. 77

## TOWNSEND

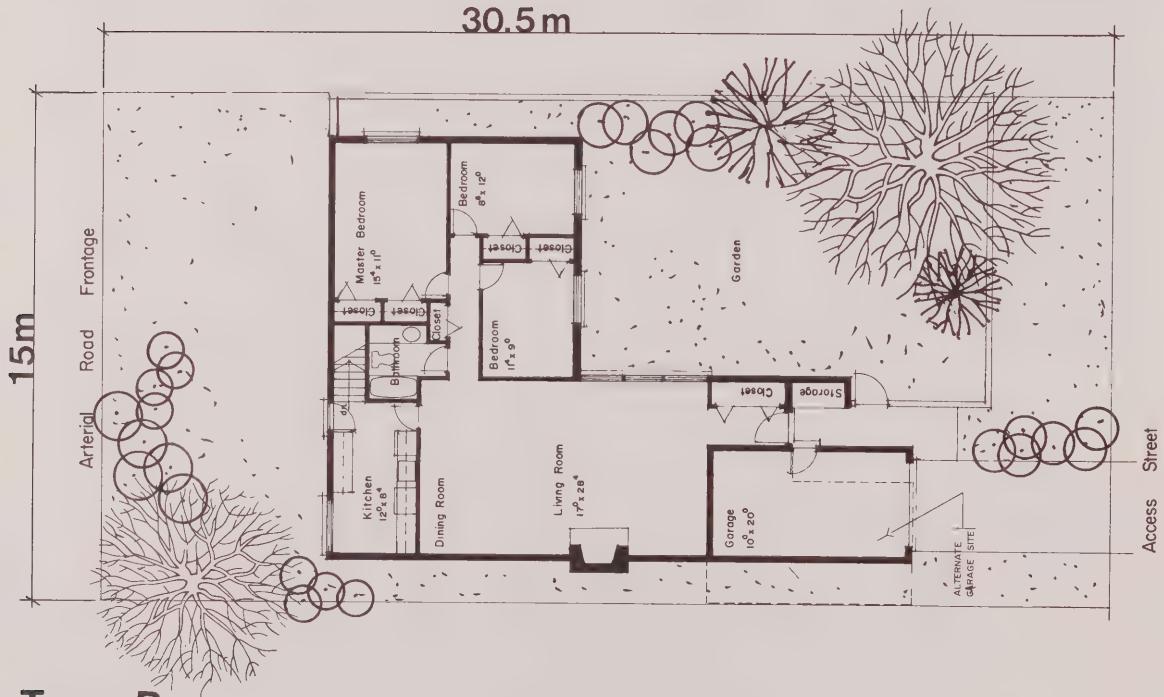
COMMUNITY DEVELOPMENT PROGRAM



Varies 30.5m min.



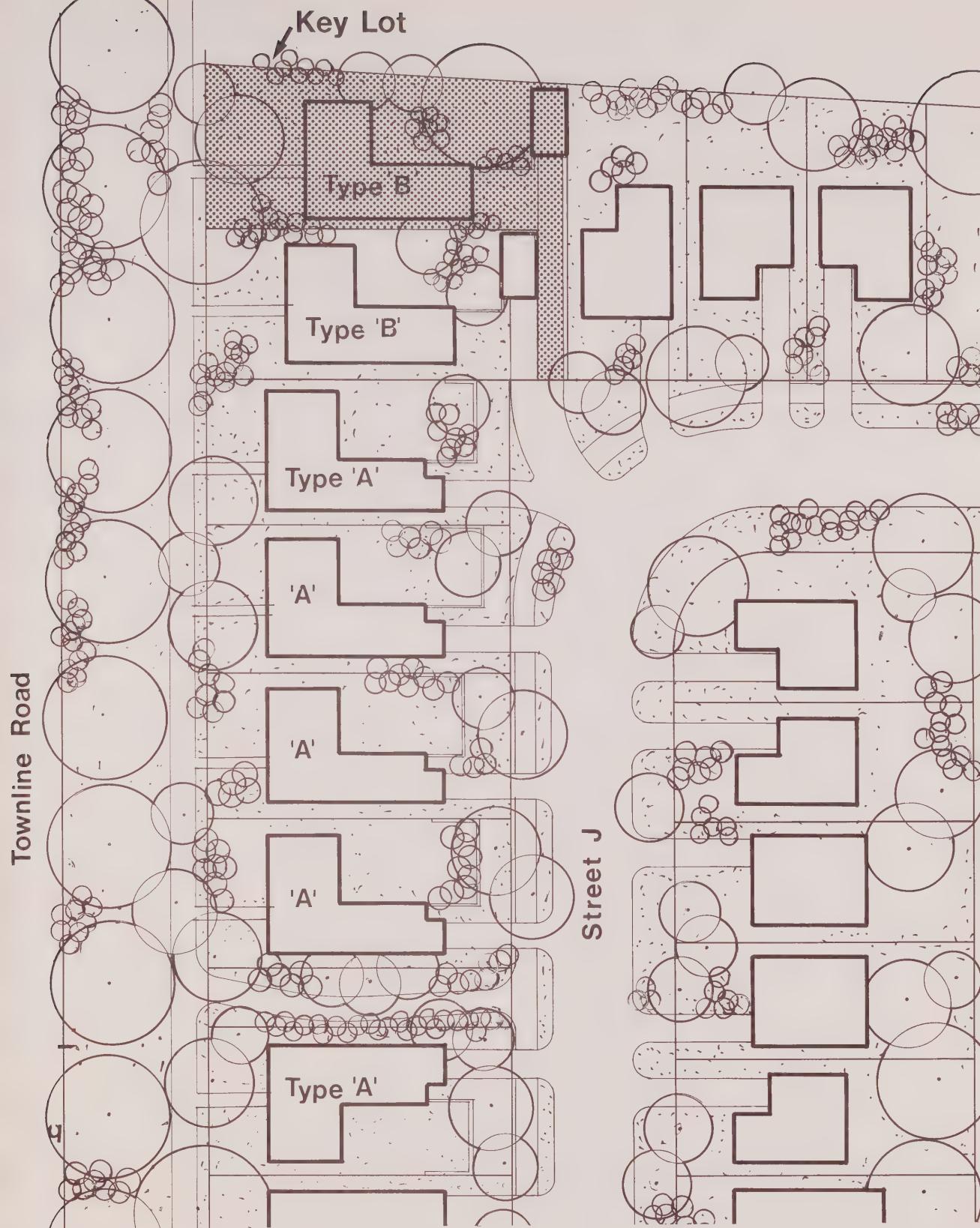
Type A



Type B

## 7.31a Arterial Edge Units Single Detached Housing

Scale 1:200



**7.31b Arterial Edge Layout**  
Single Detached Housing

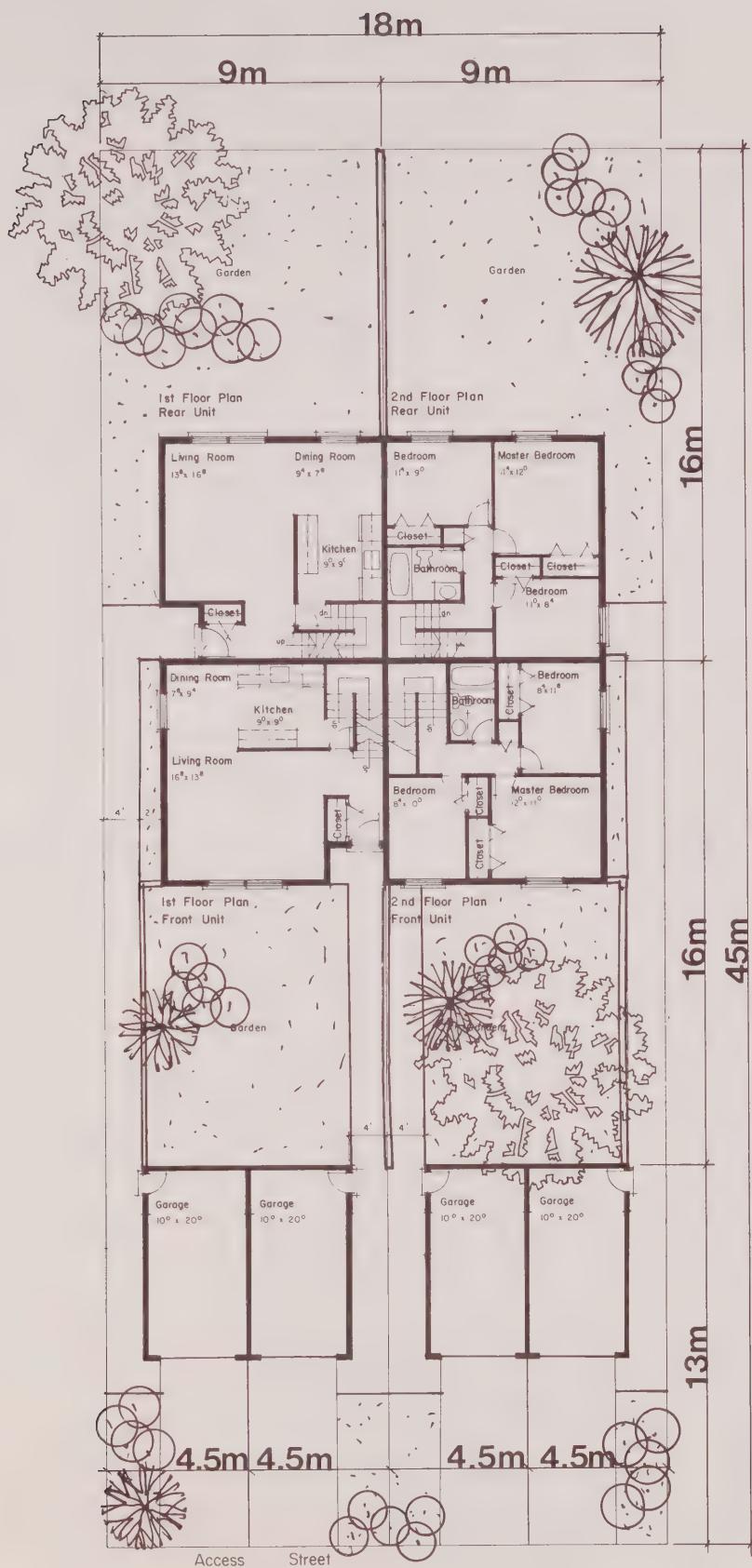
Scale 1:500

## Townline Road



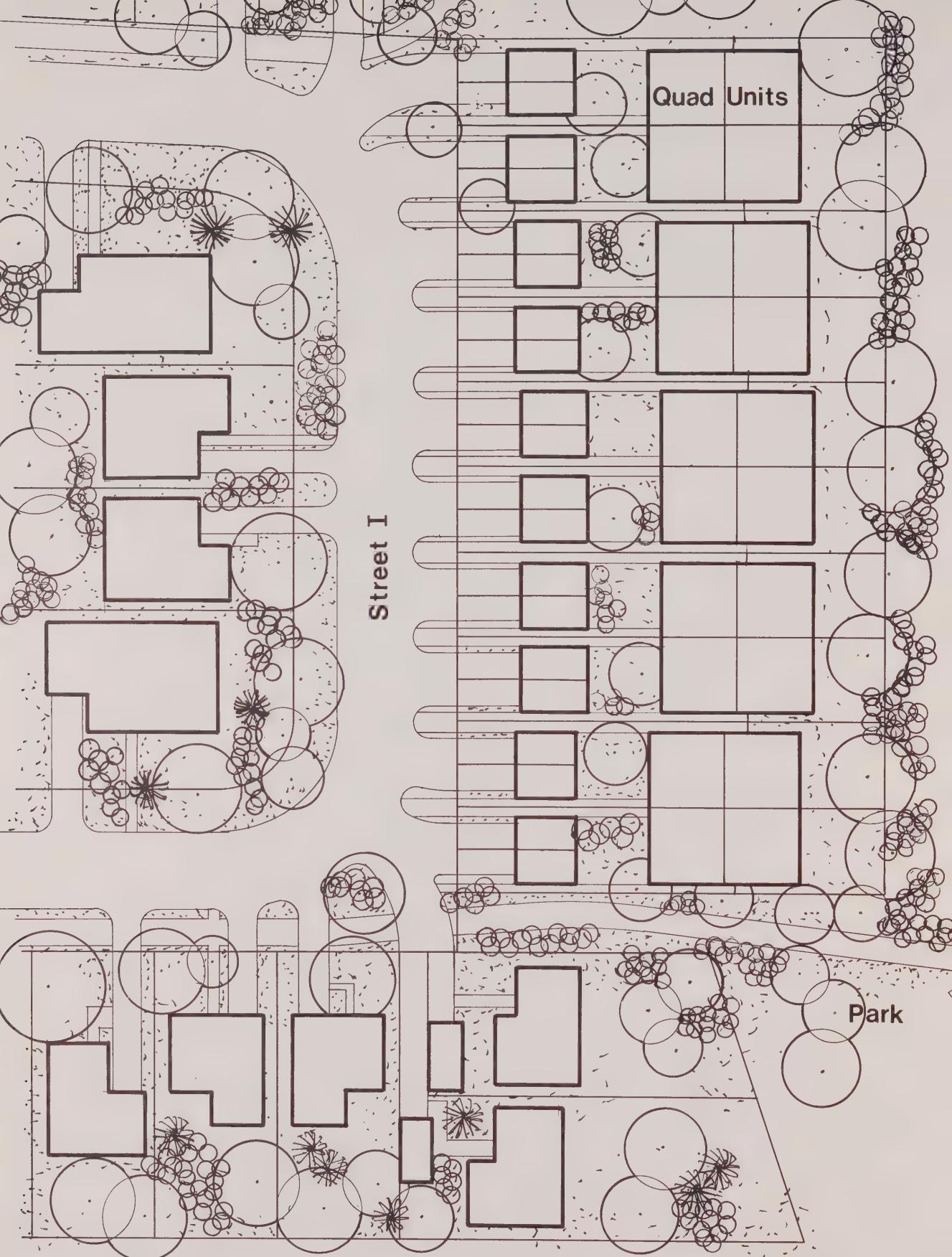
**7.31c Arterial Edge Unit and Layout**  
Multiple Housing

Scale 1:200 and 1:500



7.31d Typical Quadruplex Units

Scale 1:200



7.31e Typical Quadruplex Layout

Scale 1:500

In general, the units fronting on the collector road have been limited as much as possible without significantly reducing the overall yield. This will add clarity to the residential road system by visually distinguishing the collectors from the local streets, as well as allow for better traffic operations.

The various forms of sale units have been generally mixed within the local street pattern to create variety and diversity of housing forms in all residential areas.

The largest single-family lots (15 x 30 m) have been reserved for all lots abutting arterial roads. Where necessary to create a continuous row of lots (i.e. corners of loop streets), key lots\* have been employed. All of these reverse lots have been designed for special single-aspect units which reduce traffic noise to acceptable levels in both the outdoor areas and interior habitable rooms through the design and siting of the buildings. (See Figures 7.31a and 7.31b.)

The multiple housing has been provided in two parcels of 40 to 60 dwellings located near the school, public open space and local centre. Each of these must be designed and developed as a package. As these sites also abut an arterial road, sample single-aspect units have been designed and sited in these locations. (See Figure 7.31c.)

Both of these layouts and sets of units have been reviewed by the Ministry of Environment, and are deemed to satisfy their recommended noise standards. (See Section 3.13.)

Sites for the quadruplex units have been provided abutting the woodlot in the northeast, where the rear units will face the public park area and the front units the street. The gardens for these front-facing units are visually screened from the street by the placement of garages. (See Figures 7.31d and 7.31e.)

The apartment units are located within the local centre. It is expected that they will be designed in conjunction with the commercial facilities in an integrated complex.

\* Key lots (which are variously called flat lots, back lots or interior lots) are normal-sized lots set off from the street, but having vehicular access by a 3m (10 ft) wide strip of land connecting to the street. Although it does not have the frontage of a standard lot, the key lot is adequate in size and shape to meet all other zoning requirements.

7.21b

TEMPORARY PAVEMENT

BLOCK H  
6m WALKWAY  
0.018 haBLOCK G  
6m WALKWAY  
0.018 ha**B**BLOCK I  
MIXED  
HOUSING  
10.1 ha.BLOCK J  
MIXED COMMERCIAL  
RESIDENTIAL  
USES  
2.8 haBLOCK K  
PARK  
RETENTION  
POND  
2.6 haTOWNE LINE  
ROAD

### 7.32 Associated Facilities

The initial commercial facilities, together with the marketing centre and about 40 apartment units, have been located in the initial activity centre overlooking the Nanticoke Creek west of Townline Road. (See Section 6.32.) These facilities are planned for construction in the first year of housing construction.

On the adjacent site is the initial storm water retention pond, which with the associated parkland covers 2.6 ha (6.4 a). The open space in the southwest corner of the housing area is required for an additional "dry" retention basin that could be inundated temporarily after major storms.

The housing area contains two 3.3 ha (8.2 a) sites for a 600-pupil public elementary school and a similar separate school. The timing of the schools will be dependent upon the rate of house completion. Based upon the projected population characteristics, a 300-pupil starter school will be required when 550 dwellings are completed, and a similar separate school at 1,300 dwellings.

The schools have been located with the public parkland — the major woodlot in the northeast corner of the area and the open space associated with the retention ponds — to create a diagonal open space corridor through the housing area to the local centre. (See Figure 7.32.)

To the east of Townline Road, a site of nearly 14 ha ( $34\frac{1}{2}$  a) has been allocated to a community college. The first stage of 2,800 m<sup>2</sup> (30,000 ft<sup>2</sup>) is tentatively scheduled on this site by 1981.

A site also has been reserved for a service station at the intersection of Townline Road and the residential collector.

### 7.33 Circulation System

Regional access to the site is provided by Townline Road and the east-west road between Walpole concessions 8 and 9. The concession road and Townline Road south of the intersection are scheduled for improvement prior to the initial housing construction. An extension of the east-west road also must be made for access to the local centre.

Off these regional roads, a collector road system has been provided for access to the housing area. The collectors have a 20 m (66 ft) right-of-way with 10 m (32 ft) pavement. The collectors have been laid out to give direct access to every local street. They will be extended through the adjoining housing areas in subsequent stages of development.

The two permanent entry roads into the housing area must be supplemented by a temporary link from Townline Road to the northernmost local street. This link can be removed after another entry road is created to the north, and the space will become a housing lot.

Access to the housing lots off the collectors is provided by a series of loops, P-loops and cul-de-sacs. All of these local roads are based upon a 17 m (56 ft) right-of-way.

A separate pedestrian system has been provided following the diagonal open space system from the woodlot through the school sites down to the local centre. Pedestrian underpasses are planned at the intersection of this system with the regional roads. Elsewhere, sidewalks will be provided along the collector and local roads.

#### 7.34 Engineering Services

Preliminary layouts have been prepared for the local engineering services to ensure that the area can be adequately served. These have been planned in the context of the overall town systems. (See Section 3.40.)

The local sanitary drainage can be designed as a gravity system. The local sewers can be laid in the roadways, following the slope of the ground generally at depths of 4 to 5 m. This system can be linked to the sub-trunk west of the Nanticoke by a sewer across the new bridge for Townline Road.

Water can be supplied from the regional trunk, which will be probably laid along Townline Road up to the east-west concession road, and then in the right-of-way of the town arterial westwards under the Nanticoke. The local distribution system can be generally laid in the local roadways. Some additional links will be needed in walkways, in order to secure the water supply by creating two connections for cul-de-sacs and P-loops. However, the northern part of the housing area east of Townline Road probably cannot be served by two pipes until the next stage of development.

The surface run-off can be directed to the first retention pond next to the activity centre by the two open space corridors — the major one in the housing area east of Townline Road and the minor one west of Townline Road. Only two areas cannot be drained to the pond — a parcel of about 1 ha ( $2\frac{1}{2}$  a) in the northwest corner of the mixed housing area, and the southeastern two-thirds of the community college site.

The piped system for storm water can follow the sanitary sewers.

## 8.00 NANTICOKE VALLEY HOUSING AREA

A comprehensive design was prepared for approximately 200 low and medium density units in one of the initial housing areas. In the design, consideration was given to planning the entire residential environment — the lots and roads plus the buildings and spaces between them.

### 8.10 Housing Program

The housing is intended to appeal to two population markets that together account for nearly 80% of the projected 1,400 households: (see Tables 2.32a and 8.10)

- The moderate \$10-15,000 income group (1976 \$), mostly 3 to 4 person households with young children and non-working wives, who may be first-time home purchasers. The higher income segment of this group can probably afford to purchase housing in the \$39-42,000 range; the lower segment can afford housing in the \$31-37,000 range, or rental accommodation with monthly costs of \$250-320.
- The middle \$15-20,000 income group, mainly 3 to 4 person households with some school-age children, who may be in many cases second-time buyers. This group can probably afford to purchase housing in the \$41-56,000 range.

With most of the anticipated population falling in these two groups, the early residents will be fairly homogeneous and have similar housing preferences. All of these families with young children — whether buying or renting — will probably wish to have a ground-related house. Those with sufficient means are expected to seek a single detached home on its own lot with integral parking; those who cannot afford this type of housing will probably live in progressively more dense and less expensive housing.

In addition to the sale and rental units, the projected housing mix also specified a third type of housing suitable for conversion from rental to ownership. This housing is intended for two types of families — those who do not have sufficient equity for a down-payment, and those who are uncertain about their future because they are new to the region. Both may wish to rent initially, and then purchase their home later.

Providing units suitable for conversion from rental to ownership did not affect the site plan. These units, because they must eventually appeal to the sales market, must have all the characteristics of other houses in a similar range, including street frontage. Implementing a rental/purchase agreement, however, will have significant management implications for the responsible housing agency.

Table 8.10: Housing Program for Mixed Housing Area

	Type 1: Ownership	Type 2: Rental	Type 3: Rental/ Ownership
Number of dwellings	60-75	60-75	60-75
Price range (1976 \$)	\$39-56,000	-	\$31-37,000
Rental range (1976 \$)	-	\$250-320	\$250-320
Average density	24-30 dw/ha (10-12 dw/a)	35-50 dw/ha (15-20 dw/a)	24-30 dw/ha (10-12 dw/a)

## 8.20 Site Description

The mixed housing area is within the development area for the first 5,000 persons. (See Section 6.00.) It also has been defined as a separate parcel in the draft subdivision plan. (See Section 7.00.)

The site of 9 ha (22 a) is bounded by existing Townline Road on the east, a proposed east-west town arterial on the south, the valley of the Nanticoke Creek on the west, and an existing concession road on the north that will become a collector road.

The site has a number of special features:

- a woodlot on the northwest corner of the site and several free standing trees of quality in the eastern part of the site;

- a natural north-south drainage swale leading to the retention pond directly to the south;
- excellent views along the Nanticoke Creek and valley;
- the initial activity centre with shopping and community facilities to the south of the site.

Due to traffic operation considerations, no access to the site will be permitted from Townline Road and only one from the southern town arterial. The access from the southern arterial, and all those from the northern collector, must be at least 75 m (250 ft) from Townline Road.

### 8.30 Site Planning Dimensions

The comprehensive design provides for smaller lots and narrower road rights-of-way, but more ample public open space than is normal with conventional standards. (See Table 8.30.) The house types, however, are similar to those already being developed elsewhere in the region.

The dimensions have been selected to suit the particular conditions of the housing site and prospective market. Conventional standards, which must respond to the most general site conditions, are by necessity more conservative. The intent is to provide greater freedom for creating a distinctive residential environment — which is not usually attainable with the uniform conventional standards — and to provide a wider range of local recreation opportunities for children. At the same time, and perhaps most importantly, they also can lead to significantly lower housing costs through economies in road and service layouts.

These site dimensions must still be approved by the regulatory authorities. It is hoped that they will be found acceptable when viewed within the context of the scheme. Smaller lots and narrower roads as shown have been used elsewhere in Ontario.

Whether the Townsend residents will prefer this combination of smaller lots and extra public open space to the conventional larger lots with less public open space, is not known. The site plan can be used as a basis for discussions with potential residents to better understand their preferences.

Because of the conventional house types and potentially lower house prices, the sample developers in the region that have reviewed the plan have commented very favourably.

Table 8.30: Illustrative Site Planning Dimensions for the Mixed Housing Area

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<b>Residential collector:</b>	
- right-of-way	20 m ( 66 ft)
- pavement	10 m ( 32 ft)
- sidewalks	one side
<b>Local road:</b>	
- right-of-way	14 m ( 46 ft)
- pavement	8 m ( 26 ft)
- sidewalks	one side
<b>Local cul-de-sac:</b>	
- right-of-way	14 m ( 46 ft)
- pavement	7 m ( 22 ft)
- maximum length	180 m (600 ft)
- sidewalks	none
<b>Lot dimension: (minimum)</b>	
- single detached dwelling	9 x 23 m (30 x 75 ft)
- semi-detached dwelling	8 x 23 m (26½ x 75 ft)
- street townhouse	5 x 23 m (16½ x 75 ft)
<b>Lot sizes: (maximum)</b>	
- single detached dwelling	240 m <sup>2</sup> (2,600 ft <sup>2</sup> )
- semi-detached dwelling	220 m <sup>2</sup> (2,400 ft <sup>2</sup> )
- street townhouse	160 m <sup>2</sup> (1,750 ft <sup>2</sup> )
<b>Front yard setbacks: (from the street pavement)</b>	
- to habitable room	6 m ( 20 ft)
- to garage	6 m ( 20 ft)
<b>Rear yard setbacks: (from the property line)</b>	
- to habitable room	6 m ( 20 ft)
- to garage	nil

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#### 8.40 Site Plan

#### 8.41 Housing Types and Distribution

The plan includes 209 dwellings in a mixture of conventional housing types: (see Figure 8.40)

- 45 single detached houses with 9-11 m (30-36 ft) frontages
- 34 semi-detached houses with 8 m (26 ft) frontages
- 70 street link townhouses with 6½ m (21 ½ ft) frontages
- 60 clustered townhouses with 6 m (20 ft) frontages.



**8.40 Mixed Housing Area**



50M  
1200 FT

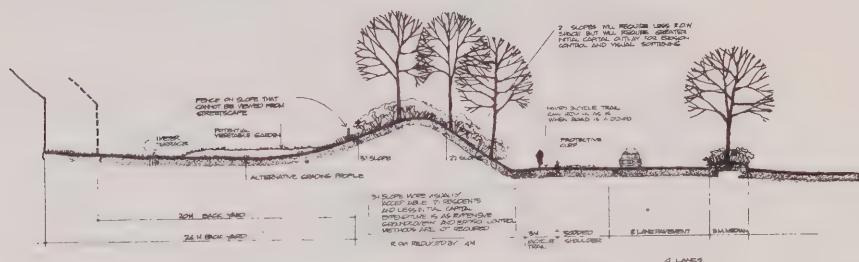
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**TOWNSEND**  
COMMUNITY DEVELOPMENT PROGRAM



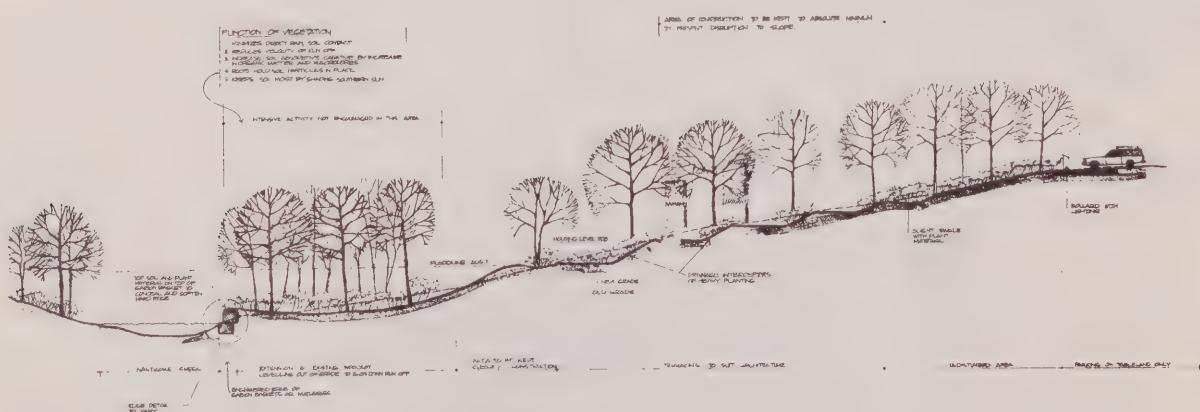
Cul-de-sac Landscaping



Noise Treatment along Townline Road



Valley Edge



Local Open Space

## 8.43 : Landscaping for the Mixed Housing Area

The dwellings with the local roads produce a net density of 28 dw/ha ( $11\frac{1}{2}$  dw/a). When the public open space and surface drainage areas are included, the resulting neighbourhood density is 23 dw/ha ( $9\frac{1}{2}$  dw/a).

The clustered townhouses with group parking — the highest density units — are located along the edge of the Nanticoke valley with direct access and views of this major amenity. These units have a public side for pedestrian access and a private side with small gardens. The dwellings perpendicular to the residential collector step down the slope. No units overlook the parking areas. These units are planned for rental accommodation, but they are also suitable for condominium ownership.

The clustered townhouses encroach upon the fill line. Development within fill lines is not always permitted because it can increase the potential for erosion. However, these slopes of approximately 15% must be stabilized whether developed or not, as they have lost all ground cover after years of agricultural use. The development can be used to stabilize the slopes, and to limit pedestrian access to the slopes by focusing movement along the paved walkway planned between the units.

The street townhouses are located along the north-south drainage swale and open space area. These units are linked by their garages in crescents around the ends of the cul-de-sacs. Many of these units are on the sloping bank of the drainage swale and can have basements that open to the outdoors. Direct access to the open space area can be made from the rear yards. These units are suitable for sale or for the rental/purchase agreement.

The semi-detached and single detached houses, which are planned as sales units, are inter-mixed along the cul-de-sac roads and the north-south residential collector. These are zero lot line units, in order to take best advantage of the reduced lot areas.

#### 8.42 Road Layout

Vehicular access to the site is provided from the town arterial along its southern edge and the collector road along its northern edge.

A residential collector is planned through the site parallel to the Nanticoke valley. This can be extended into the residential area to the north, and link to the local centre to the south. The collector will provide access to most of the housing on the site, except for the easternmost housing. Access to this area is taken from the northern collector so that no road crosses the north-south drainage swale/open space system.

The four cul-de-sacs off the residential collector are 120 m (400 ft) or less in length, and all serve fewer than 30 dwellings. Careful consideration has been given to these streets and their architectural character, in order to create a sense of identity and a place for children to play. The bulb of the cul-de-sac has been shown planted with salt-resistant trees to create a pleasant focus, and a surfaced area for snow storage and intensive play. A secondary emergency vehicle egress has been provided from the cul-de-sacs along the pedestrian path network. In addition, a guest parking area has been provided along each cul-de-sac to supplement the two parking spaces provided for all units.

The cul-de-sac linked to the northern collector road has been designed in the same way as the other four. However, it will be 150 m (500 ft) long, have two turnaround bulbs and serve about 50 dwellings.

#### 8.43 Open Space

The development has been laid out in response to the site's natural conditions. The existing vegetation of quality — most notably the woodlot in the northwest corner and several free standing trees at the eastern edge — have been retained. Special attention also has been given to conditions along the valley and the drainage swale. (See Figure 8.43.)

The site is well served by open space and recreational facilities, with the Nanticoke valley to the west and the activity centre and retention pond to the south. Within the site, therefore, attention has been given to providing complementary and ample play opportunities for children, and to providing appropriate links to the surrounding amenities.

The drainage swale has been used as the main local space area. It can be developed to create a variety of spaces along its length, ranging from heavily planted areas providing privacy for the adjacent houses to open grassed areas for informal ball games for the younger children. A tot lot has been located in the area, where it will be sheltered from the northwesterly winter winds.

This open space will contain a main pedestrian footpath, linking to the local activity centre to the south by an underpass under the town arterial. The cul-de-sacs will provide a number of east-west connections across the site from this area to the Nanticoke valley. Access into the Nanticoke valley has been combined with the pedestrian access to the clustered townhouses. As previously noted, this will restrict pedestrian access to the slopes, and thereby, protect the natural areas from intensive use.

The Nanticoke valley slope has been graded to form a series of small terraces that will act as check dams to slow run-off, and extensively planted to further reduce the potential for erosion.

A second lot has been planned on the edge of the Nanticoke valley, also where it will be sheltered by the major woodlot.

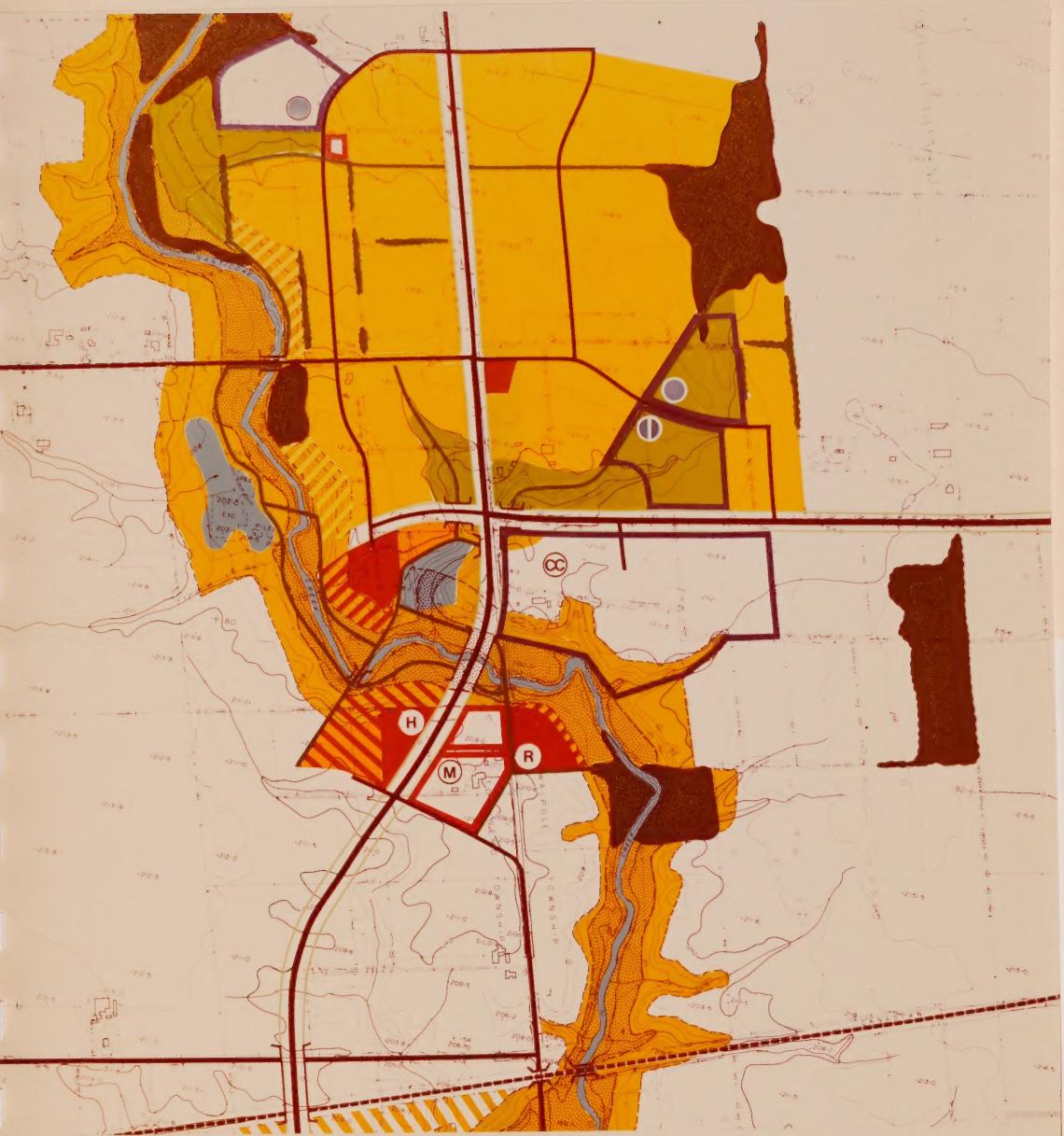
Earth berms have been planned along the two arterials to alleviate the noise generated by the traffic. They are designed with a 2:1 slope toward the arterial and a more modest slope toward the dwellings.



## ACKNOWLEDGMENTS

Llewelyn-Davies Weeks Canada Ltd. would like to acknowledge the contribution made by Stefan Bolliger Landscape Architects and Jerome Markson Architects in the preparation of this report.





## Detailed Plan 5000 Population

Housing Areas: Low & Medium Density	Public Elementary School
Higher Density	Separate Elementary School
Commercial & Institutional Uses	Community College
Natural Open Space	Regional Administrative Centre
Local Parks	Health Facility
Woodlots & Hedgerows	Hotel
Arterials	Ponds
Collectors	Pedestrian Path
Railway	Bridges & Underpasses

1 HECTARE  
1 ACRE

Date March 77

## TOWNSEND

COMMUNITY DEVELOPMENT PROGRAM



Llewelyn-Davies Weeks Canada Ltd.  
Peter Barnard Associates  
John Bousfield Associates  
De Leuw Cather, Canada Ltd.  
Ecoplans Limited





